PRACTICAL ORAL HYGIENE PROPHYLAXIS AND PYORRHEA ALVEOLARIS

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PROPHYLAXIS

AND

PYORRHEA ALVEOLARIS

BY

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SECOND EDITION, ENLARGED AND REVISED

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TO

MY FATHER

who for forty-five years of active practice
has advocated the principles of Oral Hygiene
and whose highest aspirations have been
for his son to further the cause

THIS WORK

is lovingly dedicated by

THE AUTHOR

PREFACE TO THE FIRST EDITION.

This book is written for those dentists who desire practical information on the subjects of oral hygiene, prophylaxis, and pyorrhea alveolaris.

The first section is devoted to the great forward movement of oral hygiene. Here are given methods and forms for dental inspection of school children, and a collection of carefully selected lectures furnishing the proper material for those called upon to deliver popular talks before school children and women's clubs. The author has found that diagramatic pictures often prove the most convincing way to teach the facts of oral hygiene to a patient. This section contains illustrations which may be shown and explained to a patient while in the dental chair.

The second section contains practical information concerning the most efficient methods to conduct prophylaxis in a dental practice, and names the materials to use for such work. The training of female assistants and the dental nurse question are treated in a most practical manner.

The third section is a comprehensive description of pyorrhea alveolaris. Here is described in detail the methods of treatment now prominent before the dental profession. The business phase of the question, so seldom mentioned in discussion or literature, is presented in a frank manner. The medical profession is now greatly interested in the question of "oral sepsis." To meet this advance, the author devotes a chapter to their interests.

I have frequently been asked questions on the above subjects. The articles I have written for dental journals have elicited numerous requests for further information, and I have become convinced that there is need of a book dealing with such matters in a thoroughly practical manner.

I have endeavored to familiarize myself with the methods of other specialists in this line of work, and, from time to time, have visited them in their offices in order to inspect their work, and discuss with them the methods used. A number of these men have been quoted, and, in some instances, they have prepared descriptions of certain parts of their work for publication in this book.

I am fully aware that I have not always observed the proper literary obligations; for my accumulation of material collected for dental college lectures, with no idea of future publication, has come from a store of thoughts of many writers in common.

"What he thought he might require,
He went and took."

All sources of information on these special subjects have been freely drawn on, and wherever possible, credit has been given for any matter used.

ATLANTA, GEORGIA, R. A.
February 1, 1914.

PREFACE TO THE SECOND EDITION.

The manuscript for the first edition of this work was submitted to several leading publishers, but no satisfactory arrangements for its publication could be agreed upon. This forced the publication upon the author. A local printer furnished a very indifferent piece of book-work. Notwithstanding this unfortunate mistake, many were kind enough to overlook the typographical errors and the entire edition was subscribed for within a few months after its appearance.

After a year this, the second edition, makes its appearance under more favorable circumstances. The entire subject matter has been carefully gone over, and brought up to date. Particular attention is called to the enlarged chapters dealing with dental inspection and clinics in schools. Several new lectures are added to the chapters on Popular Lectures. The third section of the work has been rearranged and all chapters enlarged. The most important addition is a more detailed description of the latest findings in regard to the bacteriology and parasitology of the Pyorrhea mouth. The Endameba Buccalis has received full attention.

Another improvement is the insertion of a large number of new illustrations. Many of these are from the author's private museum.

An index of the subject matter and an author's index have also been added.

As the work goes to press, already nearly 500 advance orders await its appearance. The author appreciates this compliment to his effort and trusts a reading of its pages will be worth while. Many dentists who have been interested in these subjects have kept up an active correspondence with the author, and for their encouragement and help he wishes to express his gratitude.

ROBIN ADAIR.

ATLANTA, GA., July 12, 1915.

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PART I.

PRACTICAL ORAL HYGIENE.

CHAPTER I.

ORAL HYGIENE MOVEMENT.

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PROGRESS MADE AND PREDICTION FOR THE FUTURE.

Only in recent years have some of the more progressive dentists begun to realize their duty to the public in the matter of educating them to the importance of prophylactic and oral hygienic measures in the care of their teeth, and of teaching them the great results which can thus be secured in the way of increased health, happiness and freedom from disease. This propaganda has been termed the Oral Hygiene Movement.

It must be admitted that the slowness of the dentists in realizing their duty along this line has been discouraging to those who have had the interest of the movement at heart, but we all know that the dental profession is a busy and hard working profession, having strenuous requirements on its time and resources. Still the time can not be far distant when the dentists of America will realize their great opportunity as well as their duty along the line of educating the people. It will mean the placing of the propaganda on a higher plane of usefulness and the accomplishment of results in every way equal to the best work done in recent years by the medical profession in the line of preventive medicine.

It can already be noticed that the dentists of this country who are interesting themselves in this movement are taking the places at the head of the profession, and are

reaping just rewards for their work in furthering the public welfare.

It has been stated that only twelve per cent. of any community pays any attention to the teeth, but, since we know how inefficient most of this care is, we realize that a very much smaller percentage practices oral hygiene in a really efficient manner.

It is somewhat of a reflection on the dental profession that a layman, Mr. Horace Fletcher, did more in a few years to acquaint the people with oral hygiene facts than did the whole dental profession in its former career.

The public is beginning to be aroused on the subject of oral hygiene and they read eagerly the magazine and daily newspaper articles on the subject. The whole trouble today is that just such trustworthy (?) facts are given them as are to be found in the columns, "Advice to the Lovelorn," and "How to Remove Freckles."

Not all dentists are in possession of facts relating to the general health and welfare, which if properly presented to the laity, would soon make the advice of the dentists as much sought after as is that of the medical man. The truth is that up to the present time, the laity and the medical profession have been ignorant on this subject, and for the simple reason that the dentists themselves have not done their duty in the way of educational propaganda.

One reason for the lack of knowledge on the part of the public is shown by the following quotation taken from a common school physiology:

"The teeth are bony keys set in the jaw-bones. Those in the front part of the jaw are sharp, so as to bite lumps of food. Those in the back part of the mouth are flat, so as to grind food to pieces. Between the ages of 6 and 13 the child loses its first teeth and gets a whole new set, and 8 additional ones. Biting hard things, such as nuts and wood, often breaks the enamel and causes the teeth to decay. When the decay reaches the nerve, the tooth aches and becomes very tender."

These false impressions, gained at an early age, are very hard to overcome when the children grow older. We should bend our energies to correct this state of affairs by establishing in our schools a brief but thoroughly scientific course on these subjects.

Not only does the proper dental attention give the owner the means whereby he can more comfortably masticate his food, but also serves as a preventive against those agents which make against his general physical welfare. The lack of this attention not only causes a filthy condition, which furnishes the bed where germs can readily grow, but also lowers the patient's resistance, and this results in physical deterioration.

A few years ago this fact was not generally recognized, but to-day the army and navy, the big factories, and even the baseball clubs often employ a good dentist, for the purpose of protecting their employees.

THE INDUSTRIAL DENTAL DISPENSARY.

The match factories were the first to recognize the benefits of protecting their employees against mouth infections. Previous to dental inspection and care, phosphor-necrosis was a dreaded and common affliction among those thus employed. Since the employment of a regular dentist, this condition has been reduced to a rarity.

Morris and Co., one of the big stock yard firms of Chicago, have just installed a fully equipped dental office for the purpose of giving their thousands of employees free dental attention. This firm was convinced that the health of its workers would be better, and that a great saving of time would result from having a dentist close at hand. This special inducement to these people saves many teeth which would otherwise be lost.

This is in line with the efforts of many of the larger corporations to guard against any thing which would incapacitate the employees from giving good service. Undoubtedly,

bad teeth are the greatest cause for loss of time, and these free clinics will, in time, be a regular equipment.

The Metropolitan Life Insurance Company, of New York, has recently established a dental clinic in its home office. Dr. T. P. Hyatt, the dental director for this clinic, writes: "I believe I am safe in saying that this is the first insurance company to have a dental director. Prophylactic treatment and examination will be given to those employees who wish to take advantage of this offer. Some 2600 have already expressed their intention of availing themselves of this opportunity. To meet this demand five chairs are being installed with five operators and four assistants. Charts have been designed for recording the condition found and provision made for recording, when necessary, the previous health record which can be copied from the Medical Record. There is also space provided for the results of radiographic, bacteriological and saliva tests.

"Those cases that are found to need operative dental work will be provided with a slip showing the teeth requiring attention, and be referred to their own dentist for this work with the request to report back to the dental clinic as soon as the work is completed. In this way it is hoped to keep the employee in good dental condition as prophylactic treatment and examination will be made twice a year. It is expected that valuable data will be secured showing an improvement in the health and efficiency of those who receive this dental attention."

Large industrial concerns like the Armstrong Cork Company, the Heinz Preserving Company, and the Larkin Soap Factory have established dental dispensaries in connection with their plants. The large department stores of Wannamaker, and Lord & Taylor, have installed a dental clinic. Dr. C. G. Anderson, the director of the dental clinic of Lord & Taylor, of New York, writes: "No charge is made for oral prophylaxis or instruction as to the proper method of tooth cleaning. . . . All employees undergo phys-

ical examination previous to their acceptance by this firm, and the time is not far distant when oral examination will be included and none accepted unless 'passed' by the dentist. This is practically in effect now. If the examining doctor discovers dental defects, the applicant is instructed to have same remedied or is not accepted."

The prediction can be made that the day is not far distant when our department stores and other business houses where the clerks come in contact with customers, will provide either by pamphlet and lecture, or by furnishing free prophylaxis, the necessary means for insuring a healthy condition of their employees' mouths, and it will certainly more than repay them for the time and money expended. We know that when a clerk with unkept teeth, shining crowns, and bad breath waits on us, it makes a difference. It also makes for a sale, if the clerk has a pretty, well-kept mouth. Here is a fertile field for the oral hygiene worker; this class of people can not pay for expert services. It costs too much and the loss of time is also an item. They are often the victims of dental parlors where their teeth are fitted with golden trappings which shine out as the headlights on an automobile.

Many of the larger southern cotton mills either employ a dentist for their employees, or make it to his interest to locate in the vicinity by giving him free rent or by other means. One mill in the Piedmont district, which owns the township, selected a well-equipped young dentist and gave him free rent, assured him the influence of the officials in his oral hygienic endeavors, and guaranteed him freedom from competition by the more or less conscienceless dentists who often infest such places. He is free to give these mill operatives much valuable advice and treatment, and in turn, they furnish their employers better work.

One not familiar with the ignorance and prejudices existing among these cotton mill operatives, can not imagine the difficulties to be met with in trying to make better their

conditions. Not long ago I was in the township mentioned and questioned some of these people about their teeth. I was congratulating them on having such a good dentist as Dr. ———. One of them said, "Dr. ——— may be a very good fellow, but I am not going to let him work for me or my family any more, for," said he, "I had the dickens of a toothache and went up to him to get it pulled and he commenced some rot about cleaning teeth and saving my tooth. I didn't have any time for such stuff, and went to Greenville and got Doc. ——— to pull it. Dr. ——— used to pull teeth, but he has got to talking so much about clean mouths that he is losing some of his trade." While the contemplation of such a clientele is not pleasant, it emphasizes more than ever the need of education on these subjects.

If we have any patients who control mills, it is our duty to show them the benefits of such service, and suggest some good young dentist for the position. To "some good young dentist" the suggestion is offered that he see some mill official with whom he is acquainted, and show him the immense advantages to be derived from having the right sort of dentist connected with the mill. The experience is well worth while, the good done incalculable, and the financial returns are generally satisfactory if the co-operation of the officials is secured.

At the present time where wages are high and hours short, officials who control large numbers of operatives are rapidly awakening to the advantages of measures which will enable them to secure more efficient services from their employees. As regards medical advice they are always ready to have lectures on sanitation, and the suggestions of the resident physician are most readily carried out.

ORAL HYGIENE IN THE ARMY AND NAVY.

If we could only realize that the condition of faulty mouths keeps our young men out from even such employ-

ment as the Army and Navy, and that so few are able to pass the simple requirements, we might wake up on this subject. Even more so, when considered that, had the oral hygiene movement started back when these applicants were children, they would not be hampered in this way. In our Philippine Army thirty-five per cent. of the catarrhal dysentery is said to be traceable to septic mouth conditions.

Thousands of applicants for our Army and Navy are rejected because of faulty teeth. Not only is this true in our Army, but in England also, it has been said that five hundred were rejected in one year because of improper oral conditions. Further than this, a report states that twenty-four per cent. of the English Army recruits have useless teeth. At Annapolis an average of only two per cent. of the men who apply for entrance, pass without first having some dental work done.

Germany has recognized that the great efficiency in her army is increased by attention to oral hygiene. The present requirement is that each soldier shall brush his teeth at least once a day, and the first sergeant in each company must see that this order is obeyed. Many other countries have taken steps along this line in regard to the armies. While America will probably never exercise this parental care, still we are bordering on this, for in the Philippine Army the soldiers are required to have monthly examinations of their mouths by the Post Surgeons.

The American Army and Navy employ the best of dentists, who secure their positions, not through any politics or favoritism, but by standing the hardest kind of examination. These men not only do repair work for the soldiers, but they, working with the medical authorities, see that their mouths are kept clean. It is a remarkable story that the Surgeon General was willing to raise the dental requirements for admission into the Army and Navy, yet, when the raise was attempted, it was found that the number of recruits was so reduced that the old standard had to be accepted.

Undoubtedly, more and better oral hygiene will be taught and required each year in our Army, and the officials in charge will find that greater efficiency, better health, and a better fighting force can be maintained by having the men keep their mouths in a clean condition.

ORAL HYGIENE IN LITERARY COLLEGES.

One of the largest and best military schools for boys is located about ten miles from Atlanta. The attendance is gathered from all over the United States, and many foreign countries are represented. I have had the pleasure of having many of these boys for patients. Almost without exception, they have presented mouths needing much attention, especially for oral sepsis. The time lost by these boys going to and from the dentist, and the loss of study-time due to pain is enormous.

The same condition prevails at our educational institutions situated in all our cities. While the dental inspection of our public schools is productive of much good, it is undeniably true that we are neglecting just as great a field in the colleges. These institutions are filled with young ladies and gentlemen who are to be the future parents and who can be made our earliest and best missionaries. At this age, fourteen to twenty-two, they are very receptive to suggestions on oral hygiene. Their ignorance of their mouth conditions and the great loss of time for the necessary dental attention causes many to delay until too late. Even those who endeavor to have their teeth looked after are sometimes recommended to the poor operators. I have known of several cases where inferior dentists have secured some of the teachers in a school for patients and have done their work free of charge with the understanding that the teachers solicit work for them among the students. In one of these instances the college officials were unable to overcome a teacher's persuasive powers with the students and the latter were led to patronize a man who was about on a par

with those employed to work in dental parlors. This happened in a large institution. How much better it would have been for the president to have had on his staff a reputable dentist to reside in or near the college, or to have had a city dentist come to the college on regular days and do the necessary dental work in a well-equipped dental office in the college building. Think of the better service and the saving of time and trouble to the teachers and students. Every institution can afford a well-equipped hospital, whereas the cost of a dental office need not be nearly so much as that of the hospital.

Some years ago, I accepted an invitation to deliver a lecture on the subject of "Teeth," at one of our larger female colleges. One of the local dentists got interested, worked up some enthusiasm, arranged the date, secured a lantern, and introduced me. My whole theme was turned to what benefits they could secure by a course on "Oral Hygiene." I made this lecture as dignified and impressive as study and slides could do. The president and the dentists followed up the suggestions, and now for several years, this institution has been giving the students a regular and systematic course in oral hygiene. There is a possibility that spasmodic lectures may do some good but if the work is carried out in the regular curriculum, as in the college just mentioned, great good can be accomplished.

Every educational institution needs, and should have, either a dental clinic or a dental department. A few years ago the practical application of this statement would have been questioned, but to-day the proposition does not admit of argument. Many institutions have operated such departments long enough to prove beyond a doubt both the necessity and the practical value of such service. One institution has gone into this matter so thoroughly, and with such success, that I include a long quotation with reference to their work. This quotation is taken from the United States Bureau of Education Bulletin, 1914, No. 40, whole number

614, on the subject of "Care of the Health of Boys in Girard College, Philadelphia, Pa.":

"Realizing the importance of the care of the teeth as a factor in the conservation of normal development and the health of the boys, and with the knowledge that a large percentage of disease and lack of mental and physical development are due to deleterious effects resulting from neglect and improper treatment of diseased conditions and malocclusion of the teeth, the board of directors of Girard College reorganized the department of dental surgery, which was formally opened on September 11, 1911. It is composed of three operating rooms, a waiting room, and a dental laboratory.

"The whole equipment in this department was selected and installed with the greatest care. The fitting out of what is one of the most elaborate dental departments to be found in any institution or school of this kind in the world has for its sole object and aim the care of the boys in Girard College and the practice of dentistry for them as an exact science. An elaborate equipment of this character has been considered unnecessary in most institution and school work; in fact, the care of children's teeth, particularly the temporary teeth, has been, as a rule, neglected by both parent and dentist.

"With the enormous task of caring for and establishing a healthy condition in the mouths of approximately 1,500 boys, the necessity for having every facility at hand for rapid, thorough, and careful work is quite obvious. The white marble partitions, white enameled steel cabinets with porcelain tops, white enameled chairs, engines, and switchboards were selected to create an impression of cleanliness and refinement which we desire the boys of Girard College to have of their dental department. On leaving college the boys will then seek to have their teeth cared for in an office where a carefully selected equipment is available and where a high standard is maintained. These are usually found in the offices of the most progressive men, who realize that

in their adoption they are enabled to advance their work to its highest degree of perfection.

"Perhaps the most evident good result has come from the new dental department. The present plan of caring for the teeth was introduced in September, 1911, and the improved condition in the health of the boys and in their personal appearance has been most marked since that date.

"It is not deemed sufficient to treat the boys in Girard College for present diseased conditions only, but to study the oral cavity as a whole. By prophylactic methods a healthy and aseptic condition is established as nearly as possible."

CHAPTER II.

ORAL HYGIENE FROM INFANCY.

SOME FUNDAMENTAL OBSERVATIONS.—SIXTH YEAR MOLARS.—MASTICATION OF FOOD.—THE NEGLECTED MOUTH.

SOME FUNDAMENTAL OBSERVATIONS.

Oral hygiene for the infant should start at its birth, and be maintained by the trained nurse until the child is turned over to the regular nurse and the mother, who in turn, should be taught to carry out our instructions for keeping the mouth in a cleanly condition. Milk, whether from the mother's breast or the cow, readily ferments in an exposed warm place, such as the child's mouth. Nearly all cases of stomatitis in young children are due to an unclean condition of the mouth. The particles of milk left in the mouth ferment and give a most fertile field for the growth of micro-organisms, which readily attack the soft and tender mucous membrane. When infections caused by these, such as follicular stomatitis appear, the child can not nurse properly.

If properly done, nothing but good can result from washing a baby's mouth. The manner of doing this is one of the simplest things, and yet, in my college work, after lecturing on the subject, I have found that few students remembered it at the time of their final examinations. The first requisite is clean hands. Around the index finger is wrapped a small amount of aseptic cotton; the cotton is then saturated with a solution of boric acid. The child is held in the arms with the head slightly back, and, as most children when held in this position open their mouths, the finger can be inserted easily. The part of the mouth which needs the most attention is not the top of the gum surface, as many

seem to think, but under the tongue, and at the lower surfaces on the buccal sides of the cheek in places where milk remains. Do not use gauze on the finger as it is entirely too rough. Rubbing is not necessary, but the simple cleansing by removing the milk debris is the proper idea. The best time for this is after the morning bath and the procedure may be repeated at night with good results.

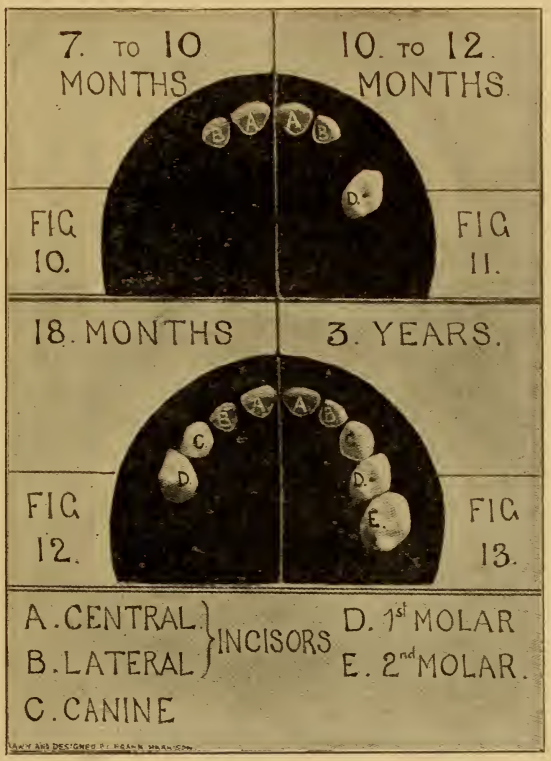


FIG. 1. TO ILLUSTRATE ERUPTION OF THE TEMPORARY TEETH, I. E., THEIR EMERGENCE ABOVE THE GUM. (HARRISON.)

When the child is about nine months old, the same method is used, and in addition, care should be exercised in wiping around whatever teeth have erupted at this time. About the tenth month it is well to secure a soft camel's hair brush, one in which the hairs do not shed, and very carefully brush

the teeth from the gums with a rotary motion, using a brush which has been dipped in boric acid solution. At this age the child will object to the cleansing and it should be done more in a spirit of play by the mother herself. Now, too, the child will enjoy the friction of the brush upon the gums. The gums may now be brushed and a small amount of massage given. This will stimulate the growth of the teeth and prove to be a great aid towards their eruption. If the spirit of play in this brushing is carried out, the child early learns to brush its own teeth, and if kept up, the tooth brush habit will be so instilled into the child's mind that much pain and many decayed teeth will be prevented in the future man or woman.

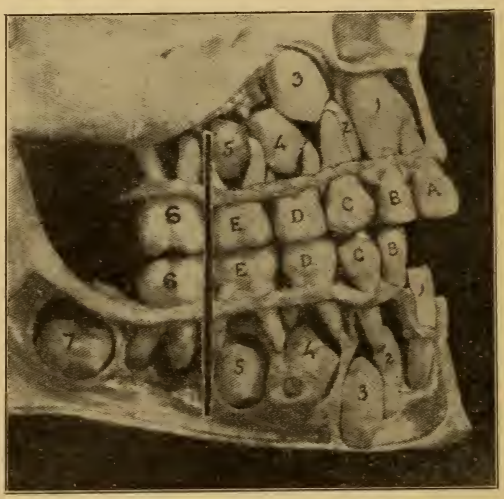


FIG. 2. A NORMAL DENTITION AT SEVEN YEARS.

The Temporary Teeth:
- A. Central, B. Lateral } Incisors
- C. Canine
- D. 1st, E. 2nd } Molars

The Permanent Teeth:
- 1. Central, 2. Lateral } Incisors
- 3. Canine
- 4. 1st, 5. 2nd } Premolars
- 6. 1st Permanent Molar, commonly called the 6-Year Molar
- 7. 2nd Molar, or the 12-Year Molar

A dissection showing the method of the eruption of the second or permanent set of teeth and the way they replace the deciduous ones. Note particularly that the tooth 6 behind the black line is a permanent one, and that it erupts independently at 6 years, and does not replace a temporary one. (Pedley.)

In dealing with the infant's jaw, we must explain to the mother that concealed in the little jaw there are twenty teeth and, in addition to this, the germs of the permanent molars; or, to go further, in the various phases of development are fifty-two teeth; and that the stress caused by this tremendous amount of nature building is very great. The comfort and health of the child depends on the temporary teeth, for their purpose is to serve until the permanent teeth take their places. The body of the child during the time served by the temporary teeth almost doubles in weight. If these teeth are allowed to decay off even with the gums, or if abscesses are allowed to form, we know that the child's body will not

FIG. 3. DISSECTED SUPERIOR AND INFERIOR MAXILLARY BONES, SHOWING DEVELOPMENT AND ERUPTION OF TEMPORARY TEETH AT THE AGE OF 9 MONTHS.

(Figs. 3 to 9 and 13 by permission Haskell Post-Graduate Dental College.)

develop as it should during this time. These are elementary facts, but unless we recall them to our minds, we are apt to forget to remind the parent, teacher, or child of them.

FIG. 4. DISSECTED SUPERIOR AND INFERIOR MAXILLARY BONES, SHOWING DEVELOPMENT AND ERUPTION OF TEMPORARY TEETH AT THE AGE OF 1 YEAR.

Thousands of infants die each year because indigestible foods and unnatural nourishment are given them, this causing so much digestive disturbance that the teeth are unable to develop for proper eruption. We often see these disorders during dentation so serious as to cause convulsions. The author used to claim that, as dentation was a physiological process, any unpleasant effects during this term of stress were the parents' fault. However, after having personal experience with children of his own, where every precaution possible was taken, and where the proper food was

given (as shown by the strong, healthy bodies and good bone structure)—still, in spite of this care, there was severe sickness and convulsions. Inquiry into other cases, where my advice had been asked, revealed the same state of affairs. This proves to me that, while these measures are advisable and necessary, a certain amount of trouble is even then apt to occur. We do know, also, that where the child is not fed properly, soft bones and unhealthy skin are the result and that where one child dies, hundreds of others must be punished in the future by weak bodies as a consequence of such negligence on the part of the parents.

FIG. 5. DISSECTED SUPERIOR AND INFERIOR MAXILLARY BONES, SHOWING DEVELOPMENT AND ERUPTION OF TEMPORARY TEETH AT THE AGE OF 1½ YEARS.

The change from the temporary to the permanent teeth has been likened to a railroad station. The traffic must

go on, the passengers and mails must be handled; yet the old depot is torn away and the new one established without disturbing any of the relations of the important traffic. Should anything happen to these trains, serious complications are sure to follow. So it is with the child: the temporary teeth are receiving their freight, the food, and it is very necessary that they should all be at the post of duty. One by one, nature takes them away and replaces them by proper structures. This can and should be done with no more inconvenience to the child than is suffered by traffic when a depot is replaced by a large passenger station. If anything should happen to the child's teeth so that they are not as strong as they should be and daily use is prohibited, we shall always find a defective individual. Thus, it behooves the dentist to call the attention of the mothers to the importance of proper feeding.

Undoubtedly one of the most serious calamities which can occur to a child is the pushing out of the front portion of the jaws. This is often caused by the rubber teats or pacifiers, and by thumb-sucking. No child's jaw remains normal if such things are allowed. This is so serious as often to cause enlarged tonsils and adenoids in addition to the pushing out of the jaw. Many prominent physicians recognize the danger from such sources and recommend that the rubber teats be laid aside and that a large-size finger cot be used on the spout of the ordinary feeding bottle, this to be used only until the child is about three months old, when he can be taught to drink from a cup. If this be done, the child probably will not be a thumb-sucker. When a baby has its temporary incisors and one or more molars and is biting and chewing everything within reach it is evident that nature intended these teeth for use in masticating food. The mouth and teeth, to grow, must be exercised; and, as the child at this time is probably about nine to twelve months old, in addition to milk, starchy foods can be digested by the stomach. The top crust of bread, whole wheat, and so-

called graham bread, and such foods contain nourishment and possess just enough roughness to produce a laxative effect. It is not advisable to give the child meat at this age, but bones free from gristle are appreciated by the baby and aid it in cutting teeth.

FIG. 6. DISSECTED SUPERIOR AND INFERIOR MAXILLARY BONES, SHOWING DEVELOPMENT AND ERUPTION OF TEMPORARY TEETH AT THE AGE OF 3½ YEARS.

Another mistaken idea is that because the child is drinking a large amount of milk he does not need any other liquid. Milk, while liquid at the beginning, is converted into a solid soon after it is swallowed. The child should be taught to call for water. A great amount of constipation in infants could be prevented if the parents would give them water frequently between meals. If we want to cause the child to become a so-called "bolter" of food, just keep on mixing

soups and patent foods that can be swallowed without chewing. All children want to crowd their mouths with food just as full as they can, but they can not swallow this without chewing. Therefore, give them food as dry as possible. Proper chewing not only causes the salivary glands to be developed, but also causes the development of the muscles, the jaws, and the teeth.

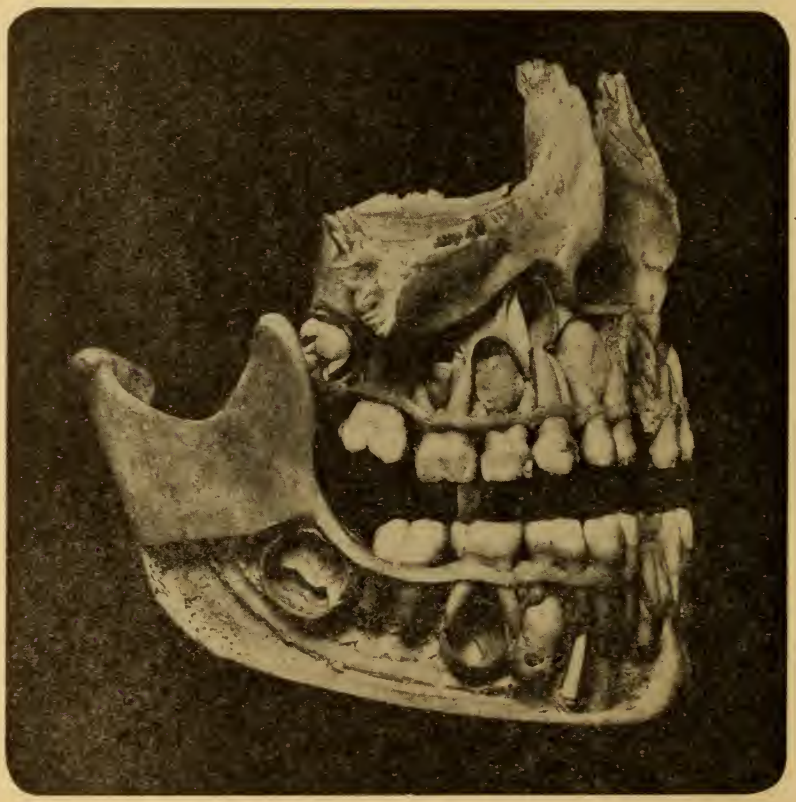


FIG. 7. DISSECTED SUPERIOR AND INFERIOR MAXILLARY BONES, SHOWING DEVELOPMENT AND ERUPTION OF PERMANENT TEETH AT THE AGE OF 6 YEARS.

The mother may talk about brushing the child's teeth all she wishes, she may brush them in spite of the tears and fighting, nevertheless, this will not have the effect of her

example of brushing her own teeth in sight of the child. Example, with the child, creates an interest which certainly will become a habit later on. In the case of my own child, she will fight and scream if the nurse attempts to brush her teeth, yet, at the regular time, when the mother brushes her own teeth, the child will run into the bathroom and ask for a brush and will gladly follow the example. It is a lamentable fact that so few mothers appreciate the importance of brushing and caring for the temporary teeth of the child. If the child cries when it eats sweets, or has the toothache at night, then the mother makes an examination of the little

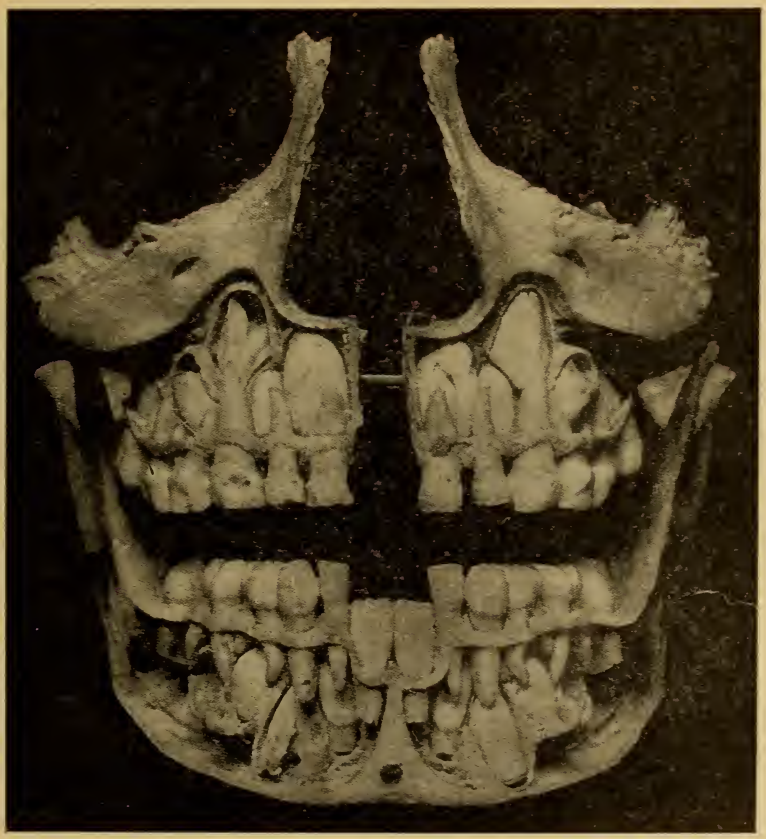


FIG. 8. DISSECTED SUPERIOR AND INFERIOR MAXILLARY BONES, SHOWING ERUPTION OF TEMPORARY AND PERMANENT TEETH AT 6 YEARS.

mouth, but if she could only realize it this cry of the child is the danger signal and it is too late to save the tooth. If the mothers would only realize how much suffering could be spared the little ones and how much better the dentist could make friends with the child, if no such painful cases of neglect were allowed! When the child comes to us with the infected tooth, septic material forced into the surrounding structures, the tooth raised up in its socket too sore for us to touch, then it has to be extracted, or the child must go through an awful experience of having the cavity cleaned out and the tooth treated, which can never be forgotten.

FIG. 9. DISSECTED SUPERIOR AND INFERIOR MAXILLARY BONES, SHOWING DEVELOPMENT AND ERUPTION OF PERMANENT TEETH AT THE AGE OF 11 YEARS.

When we realize that carious temporary teeth almost always must be sacrificed, and that carious permanent teeth sometimes cause the loss of life, it seems that these conditions would be reduced to the minimum and that, instead of waiting for the cries of the child and suffering so awful that the child becomes prejudiced against the dentist at an early age, the dental profession could be brought to give the youth of our land some sort of inspection, some system of supervision, which in the years to come would so impress itself on the minds of the parents and teachers that, instead of the constant retrograde of the teeth, we should at least improve them to that degree which we find in the former races. Our children are born just as healthy as in prehistoric times. They have just as good bones, and, with proper instruction in oral hygiene, the teeth would be in accord with the rest of their bodies.

Nodine calls attention to the fact that "an extensively decayed deciduous molar puts five teeth out of commission, by which the chewing apparatus is rendered ineffective, i. e., the decayed tooth, the tooth on either side, and the two teeth above." In the same paper, he also comments on the result of an examination made in the Breslau public schools for defects in speech, which showed that about half of these were of dental origin, either from decay, loss, or deformity. "For the correct pronunciation of certain sounds, deciduous teeth must be in their true position, neither decayed nor missing. Incisors are necessary for the pronunciation of the 's' sounds. . . . When the molar teeth are lost or pushed out of alignment, and the arches are contracted, a hissing sound is often produced. This lisping and hissing may be continued as a habit after the eruption of the permanent teeth."

SIXTH YEAR MOLARS.

Dr. Woodbury, of Boston, calls the sixth year molars the "working tools of mastication. Their work begins at once

and lasts throughout life; upon them rest full growth and development; upon them depends good health during life." If this is true, we have the key-note for a great deal of dental irregularities due to mal-occlusion, food pockets, contracted jaws, and also a great many pathological conditions. One has only to examine the mouths of a moderate number of subjects to be astonished at the early removal of one or more of these sixth year molars. As these teeth come out just back of the temporary teeth, the parent is careless about the child brushing them properly, thinking that they, too, are temporary teeth to be soon shed. They are generally covered with a mass of sticky food which furnishes nutriment for germs of decay. (Fig. 10.)

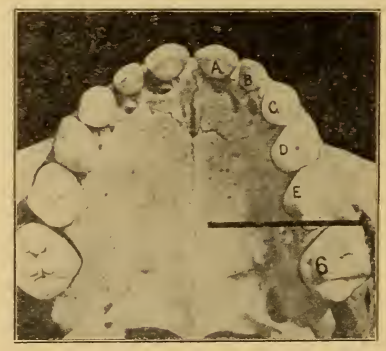


FIG. 10. A NORMAL DENTITION AT SEVEN YEARS.

The Temporary Teeth:

A. Central, B. Lateral } Incisors
C. Canine
D. 1st, E. 2nd } Molars

The Permanent Teeth:

6. 1st Permanent Molar, commonly called the 6-Year Molar

A black line marks the termination of the deciduous or milk teeth. Most mothers imagine that, because no baby tooth has been shed, 6, (the first permanent molar) is a temporary tooth. At seven years of age this tooth is often in such an advanced stage of caries that conservative treatment is difficult if not impossible. (Pedley and Harrison.)

In examinations which I have made at the "Home for the Friendless," of children from six to fifteen years of age, in

our city hospitals, and among students of the dental colleges, there is one defect more prominent than all others, and that is this condition of loss of the sixth year molars, especially in the lower jaw. If it were only the simple loss of the tooth, it would not be so bad, but nature, attempting to close up this space, tilts the next four or five teeth, causing them to get so far out of place that the proper mastication of food is impossible.

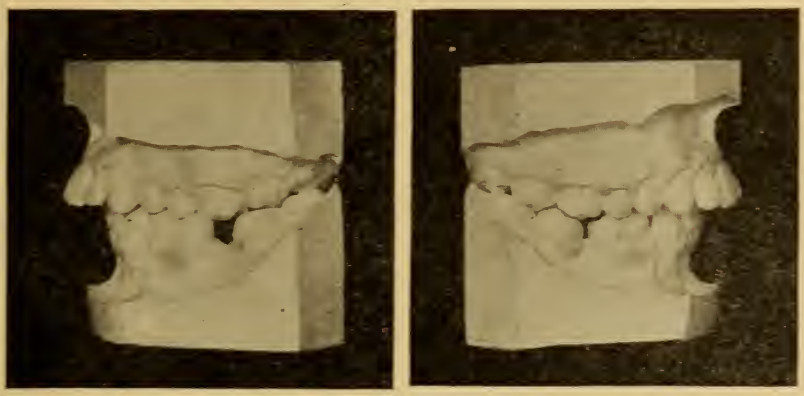


FIG. 11. Models of a young lady 21 years of age, showing mal-relationship of arches caused by early loss of lower six-year molars. (Case of Dr. Clinton C. Howard.)

It should be the duty of all teachers of oral hygiene to show on their screen pictures illustrating the result of this condition or to draw them on the blackboard. (Fig. 11.)

Dr. Potter, in an article published by the "Dental Hygiene Council," of Massachusetts, says, in reference to the statistics which he reported in Brookline, Mass., "The sixth year molar has aptly been styled by Dr. Bogue, the principal molar of man. All will, I believe, agree with this designation. If the tooth is in large measure or wholly destroyed, the efficiency of the teeth, as masticating powers, is largely lost. In 345 pupils, from eleven to fourteen years of age, 18 per cent. had lost both crowns of the lower sixth year molars, and 24 per cent. had lost one crown of a lower sixth

year molar. In the same number of pupils at the same age, 6.9 per cent. had lost both crowns of their upper sixth year molars, and 13 per cent. had lost one crown of their upper sixth-year molars." (Fig. 12.)

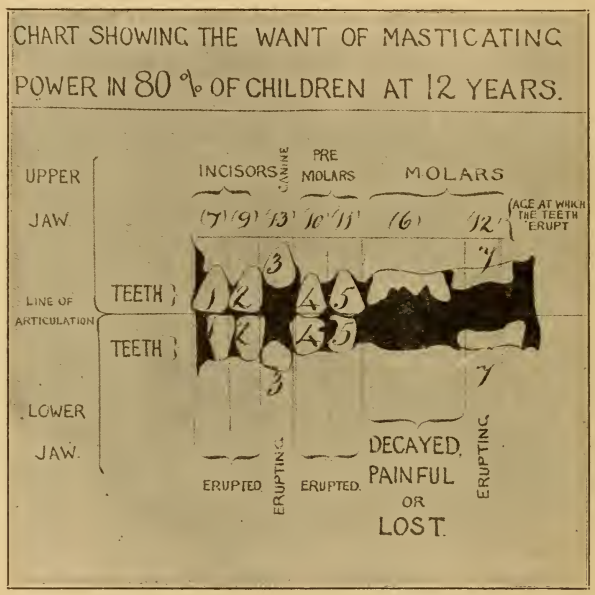


FIG. 12.

The best remedy is that described under "Technique of Prophylaxis," which is the covering of this tooth as soon as it erupts, but, as comparatively few people to whom we talk will be receiving regular prophylaxis care from a dentist, we should in all our lectures particularly stress the brushing of this tooth.

MASTICATION OF FOOD.

In our former races both the skulls of adults and of children exhibit a smaller number of carious teeth than we are accustomed to find to-day. This is undoubtedly due to the fact that they had coarse food to chew, for the cusps of the museum specimens are worn nearly to the pulp. Such a

thing in children to-day would be a dental rarity. Thus, we must conclude that it is the duty of the dentist to acquaint his patients with these facts and instruct them to provide their tables with some food which will require very thorough mastication. While such teaching may not at first be very popular, there are many of our good patients who would undoubtedly put this into practice if acquainted with the beneficial results which would surely ensue.

FIG. 13. DISSECTED SUPERIOR AND INFERIOR MAXILLARY BONES, SHOWING DEVELOPMENT OF THE PERMANENT TEETH AT THE AGE OF 13 YEARS.

It is unfortunate that the temporary teeth of our children, just at the stage when thorough mastication is of greatest importance, are allowed to decay to such an extent

that it becomes a painful operation for the child to masticate food at all. It is at the age of from eight to twelve that the greatest developments should take place, but the examination of school children has shown that a large majority of them are dental cripples. It is time for the dental profession to wake up to its opportunity and duty and to try to instil into the minds of their patients and the people at large these important facts about the care of the teeth and the prevention of disease. Instead of pies and soft foods the children should be taught to eat food which requires thorough mastication. I am always telling my students that the tough meat at the boarding houses is one of the greatest Godsends which they have, if they will only take advantage of it, and learn to thoroughly masticate their food. I have been told that some of them found a certain amount of consolation in the experiment.

Nature furnished man's jaw with a series of muscles strongly attached to the jaw bones in order that the food might be given the proper amount of mastication. The muscles in this position are subject to the same laws of development and increase of power through exercise as the muscles in other parts of the body. It is a fact which can be easily demonstrated that the person who chews well has a much larger set of muscles than the person who chews but little.

It has been shown heretofore that primitive man's immunity from decay was due to the perfect mastication of his food. The one factor in our future work on prophylaxis which must be emphasized more than heretofore, is the use of our jaws. Dr. G. V. Black, in his book on "Operative Dentistry," describes an instrument, the gnathodynamometer, by which the force of the ordinary bite may be measured. This has been found equal to three hundred pounds. Nature certainly intended us to make use of this tremendous power with which we are supplied. However, we are unfortunately not given this opportunity often, for our housewives

would feel chagrined if there appeared upon our tables anything which would necessitate any large amount of chewing before it is swallowed. The whole idea of cooks seems to be to eliminate anything which requires much mastication and deprive us of this exercise which is so important to health and comfort.

The idea is often held by the laity that the teeth are easily injured by the materials for cleaning and brushing them. Many patients, I have found, look with horror at the simple cleaning of the teeth, or the directions for use of a dentifrice, with the idea that the enamel of the teeth can be easily removed. This is one of the illusions that I first try to get out of the minds of the freshman dental students as well as the new patients who come for prophylaxis. They must be brought to realize that the enamel of the teeth is one of the hardest substances in nature and it is made to stand the hard usage that a life-time service demands. The abrasion that ensues from prophylaxis, the cleaning of teeth, and the brushing of teeth will not in any way measure up to that destruction which is sure to follow the lack of these precautions.

THE NEGLECTED MOUTH.

By an editorial in the *Dental Dispensary Record* (March, 1910) Dr. Belcher thus expressed himself:

"A child can not be expected to develop into a healthy adult if he is deprived of efficient means of chewing his food properly, or if the food must pass through an uncared for mouth that is more like a cesspool than a receptacle for the transmission of food to the human body, every ounce of which must pass through this disease-breeding area on its way to the stomach, burdened with numerous colonies of poisonous germs, of which over twenty harmful varieties have been found in unclean mouths. No wonder such children are sickly and lacking in strength to resist disease, or that they are not considered bright and intelligent, and figure

many times as members of our mentally deficient classes in the school work. Not only this, but an unclean mouth is the direct cause of many earaches, enlarged tonsils, adenoids, stomach ills, and that most dreadful of children's diseases, diphtheria, is invited."

FIG. 14. First Picture.—Child, age six, with full complement of deciduous teeth. Note symmetry of features.
Second Picture.—Same child. Picture taken three years later, during which time the four six-year molars were lost through neglect. Note mal-development of jaws, which is partially due to the absence of these most important teeth. (Case of Dr. Clinton C. Howard.)

Under the title of "Clean Teeth on the Market," *Dental Dispensary Record* (March, 1911), Dr. Agnes de Lima, of the Bureau of Municipal Research, of New York, says:

"Doctors still prescribe tonics for invalids whose decaying teeth are draining their vitality, more than any other cause, and fortunes are spent to attempt to cure tubercular parents who reinfect themselves every time food, medicine and saliva pass over their diseased cavities and gums; millions are spent on purifying the water supply and the soil; medical institutes are endowed to stamp out the contamination of food and air by 'pathogenic bacteria,' but the prime

breeding place for germs—the human mouth—is neglected and uncared for."

In the same journal (Nov., 1912) Dr. H. N. Holmes writes some strong arguments:

"When the slightest eruption of the skin occurs, no matter what the cause, we begin treatment for it, and if it doesn't heal in a short time we consult a physician, and if he fails to get results, we are thoroughly aroused and seek a specialist without delay, but with the mouth it is quite the reverse.

FIG. 15. Same as Fig. 14 at age 18, showing progressive mal-development of the jaws, greatly due to the abscence of the "Keys to the Arches"—six-year molars. (Case of Dr. Clinton C. Howard.)

"Not one person in twenty after the age of thirty has a mouth in a healthy condition, and not one in ten has a mouth free from pus at any time.

"We wash our body once a day and our faces and hands several times, but, alas, some of us have our mouths cleaned once or twice a year—maybe. Even then it is seldom well done, for dentists as a rule slight such 'jobs,' for if the patients haven't enough decency, pride, self-respect or what

you may term it, for others, than to present themselves with a chloride of lime breath, far be it for the dentist to turn policeman at this age."

Marshall, in his "Mouth Hygiene," calls attention to the fact that practically no one escapes the diseases of the mouth, and that dental decay is, without doubt, the most common disease that afflicts the human family. He further states that in his practice of about forty years, he has not seen but about four instances where persons had reached mature life without some form of dental decay.

CHAPTER III.

POPULAR LECTURES ON DENTAL SUBJECTS.

"TEETH AND THEIR CARE," LECTURE ISSUED BY MICHIGAN DENTAL SOCIETY.—OUTLINED LECTURES BY DR. STEVENSON: (1) FOR MOTHER'S CLUBS, (2) TO CHILDREN, (3) FOR NURSES AND PHYSICIANS, (4) TO KINDERGARTEN.—LECTURE BY DR. ALBRAY.

The subject of oral hygiene is now causing such interest that even dentists in small towns are being called on to deliver lectures before the various schools in their localities. This often places the dentist in a difficult situation, because, in the first place, the subject is new and he is often not acquainted with it. Dentists are not in the habit of writing papers and delivering lectures, and this new request, put before them, sometimes startles them. Again the subject matter is hard to collect and get in shape for a suitable lecture. Many times I have heard of lectures that were utter failures owing to the fact that they were too scientific and did not give elementary facts. Every dentist who does any lecturing along this line has been called upon by his various friends for facts which will constitute the right sort of lecture in this regard. With these facts before me, I have determined to give the frame work of some good lectures at some length, so as to meet this requirement. One of the best that was furnished me on this subject was sent in by the *Dental Summary,* issued by the Michigan Dental Society. While this lecture seems very elementary, it was delivered before the senior class of a high-grade female college, and the results which followed it show that it contained the proper material for this kind of lecture. The great trouble

is that we forget how little the people know on this subject. This is one of the points which will have to be guarded against. This lecture and those following, are among the best which have appeared in dental literature.

"TEETH AND THEIR CARE," LECTURE ISSUED BY MICHIGAN DENTAL SOCIETY.

Recent examination of the teeth of school children in many parts of the world shows that about 96 in every 100 children have diseased teeth.

Think of it: Only about four children in a hundred who are not suffering more or less from diseased teeth.

This would be bad enough if the toothache were all the little ones had to suffer as the result of somebody's neglect; but, as simply a matter of well-known fact, the toothache is the smallest part of the trouble. In fact, toothache is not the trouble at all, nor any part of the trouble; it is simply the cry of the nerve, trying to arouse attention to the fact that something is wrong; the call of the nerve to be delieved from the poison that is killing it.

Statistics show that on account of poor teeth the mental and physical development of the child is seriously retarded.

The more the physical and mental development of the child is disturbed and retarded, the less is, of course, the general capacity of the child.

The worse the teeth, the lower, as a rule, is the school-standing of the child.

Dr. Luther H. Gulick, of New York City, is responsible for the statement that of 40,000 school children examined, those with two or more bad teeth averaged five months behind the grades that they should occupy, and would occupy were their teeth sound. Adenoids were responsible for lagging to the extent of eleven months.

As decay spreads from the rotting apple to the sound one by its side, so does it spread from the first decayed tooth in the temporary set to the next and the next; and so does it

spread from decayed first tooth to sound second, or permanent one, coming in alongside of it. In a very short time, if neglected, the second teeth are as bad as the first.

Because of poor teeth, the child swallows its food unchewed, and the habit of bolting is formed. The youth also, for the same reason, swallows his food unchewed, and the habit becomes fixed. The unchewed food is not digested; indigestion and bowel troubles follow, and the child, if it survive, becomes a weakly, undeveloped man or woman, an easy prey to tuberculosis and the host of other ills that prey upon people of low general vitality.

This is no overdrawn statement; it is amply proved by experience and statistics.

No claim is made, of course, that bad teeth are the sole cause of disease. Abuse, in like manner, any other part or organ of the body, as important as the teeth, and disease is sure to follow.

Now, a very large part of this suffering—the half-starved body and the weak brain that follows it naturally grows out of pure neglect; and by far the greater part of this neglect is due to ignorance. And it seems strange indeed that the world should have been so tardy in realizing the importance of the teeth, and the necessity for their intelligent care. This condition of ignorance may be charged to what seems to be an innate tendency upon the part of scientific men generally to dig and delve in search of the obscure and the comparatively unimportant, while overlooking the much more important and perfectly obvious facts immediately under their observation.

Let it be understood at the outset that a clean mouth and sound, well cared for teeth are positively essential to perfect health; even to the average of good health; and that such teeth, used to masticate the food as intended by nature, will go a long way toward inducing and conserving that degree of health.

If we would intelligently care for the teeth, we must first learn to know something about them; how many there are

in the first set and what they are; how many there are in the second set and when they are cut; the relation of the first set to the second, etc.

It will, perhaps, help us to remember the number of the first or temporary teeth if we associate them with the fingers and toes. Ten fingers—ten temporary teeth in upper jaw; ten toes—ten temporary teeth in the lower jaw; five on either side, both in the upper and lower jaw.

The first teeth are usually all in by the end of the second year. The first to be cut are the lower front teeth, the central incisors appearing, as a rule, about the seventh month, and lasting usually, until about the seventh year, when they are replaced by the permanent incisors.

The incisors are the cutting teeth. From the same root word we have the word "scissors," you know.

The other temporary teeth appear at short intervals, until, by the end of the second year, the entire twenty are in place.

Now, it is of the utmost importance that these twenty teeth remain in place with their crowns undiminished in size by decay, until the permanent teeth are ready to replace them. The first teeth should be displaced and pushed out by the second or permanent set. Why is this so important? Many parents think that the first teeth amount to very little, and the sooner they are gotten rid of the better. There could not be a more serious mistake. Let us see.

We already have considered the effect that decayed and aching teeth have upon the habit of chewing the food. Teeth, especially teeth that are just coming in, require exercise precisely as do other parts of the growing body. When the first teeth are decayed, painful or lost, the permanent teeth do not have exercise they need, because the food is bolted; that is, swallowed without being chewed, or after being only partially masticated. And there is another reason why the retention of the first teeth is so important:

About the time that the first front teeth are beginning to loosen, another tooth, the largest and most important tooth

of all, is pushing its way up through the gum, right behind the first "baby molar," or double tooth. If this last baby tooth or those in front of it, have been made narrower than normal, or have been lost altogether on account of decay or premature extraction, this big, new tooth, which is a permanent one, the sixth from the center in front, and coming in at the sixth year of age, and not being guided into its proper place and kept there by sound first teeth, comes in out of place, too far forward.

Sometimes it is the width of the tooth, sometimes the width of the whole tooth, too far toward the front. What difference does that make, some may ask? Isn't the tooth there? Will not the other teeth, coming in later, force it to its proper place? No; that's just the difference it makes; that's just the trouble.

When the first big, strong, permanent, most important tooth comes in too far forward, the jaw is shortened by just that much, and it remains too short.

It is generally supposed that the jaw controls the location of the teeth in what is called the arch; that is, the semi-circle in which the teeth are located; but that is only another of the many mistakes most people hold in regard to the teeth. The jaw does not control the teeth, but the teeth control the size and shape of the jaw.

Now, into this shortened jaw, in front of the sixth-year molar, five permanent teeth must find a place. How are they going to do it? Well, most of you have seen mouths filled with crowded, jumbled, crooked, overlapping teeth; and that's how they do it. They come in where they can, following the line of least resistance, with nothing to guide them. (*)

The sixth tooth, the six-year molar, coming as it should do and usually does, before the first or temporary teeth are lost, is usually regarded as a temporary tooth also, and is allowed to decay, even by parents who mean to give their children the best of care, under the mistaken impression that

it will soon be replaced by another and a permanent one. BUT IT WILL NEVER BE REPLACED. The six-year molars, and all the other molars, are cut but once; once lost they are gone forever. They never will be replaced, except by artificial substitutes, a very poor dependence at best.

And this six-year molar is the most important of all the teeth. Upon its proper location and preservation depends, to a very large degree, the safety, the beauty and the usefulness of all the other teeth.

When the teeth are all in their proper positions, they form a beautiful even curve, the sort of curved line that nature delights in; and the features possess the contour and balance that make the face so attractive. (Figs. 16 and 17.)

FIG. 16. THE IDEAL DENTITION, BUCCAL VIEW.

When the teeth are lost, or all jumbled together, the jaws are too small, the lips hang open, and the harmony of the face is marred, when not entirely destroyed. (*)

There is, of course, a much more important phase of the subject than mere appearance, although that is certainly important enough, often making or marring the entire life. The more important fact is the use of the teeth as they should be used, to conserve health and strength of the entire body.

When the teeth are all in their proper places, and stand at the proper angle with the jaw, the grinding surfaces of the upper and lower teeth fit together very closely; and, like the mills of the gods, they grind exceedingly fine, preparing the food as it ought to be for the digestive process that follows. But if one is lost, especially if that one be this first permanent molar, the grinding surfaces drift apart; and, if the difficulty is not quickly and skilfully remedied, the work that the teeth should do, never can be done properly.

FIG. 17. THE IDEAL DENTITION, LINGUAL VIEW.

Then, too, of course, crowded and irregular teeth are much more difficult to care for, to keep clean, they are much

more likely to decay, and the gums are much more subject to disease.

Remember, then, that the tooth coming in at the sixth year, the sixth tooth from the center in front, is the first of the thirty-two permanent teeth, which, with the care that all of the teeth should have, ought to last each of us to the end of life. (**)

If the child is to have strong, tough, resistant teeth, it is essential that its food contain an ample supply of the bone-building salts of lime. These salts are essential for other purposes as well. When it is known that the epidermis or skin, the bones and the teeth are all built of the same kind of cells, and that these cells depend for their perfection upon salts of lime, the importance of this kind of food readily will be recognized.

The bottle-fed baby, brought up on the prepared foods so abundantly on the market at this time, starts life with a very serious handicap. According to the authority of scientific men, who are making these subjects the study of their lives, these prepared foods, nearly all of them, are altogether deficient in the bone-building elements.

The best substitute for the nursing baby's natural food is cow's milk. Don't forget this; don't be deceived by alluring advertisements written by men who either do not know or care to know what they are talking about.

The eruption, or cutting of the deciduous, or temporary, or first molars, indicates that the system of the child is ready to assimilate solid foods, and if he is given really solid foods, and taught to thoroughly masticate them, it will be well with that child.

Every meal should contain something that requires good, vigorous chewing; like every other part of the body, the teeth, gums and jaws require and are developed by exercise, and suffer from lack of it.

Among the foods rich in the bone-building phosphates of lime, wheat stands high. But, in the process of making

fine, white flour, half of the lime-salts are lost and withdrawn with the bran. Whole-wheat bread, while usually not so easily digested, is a much better bone-builder, and any form of whole-wheat, containing every particle of the grain as nature makes it, is a perfect food, and should be largely used.

No bread should be eaten until it is twenty-four hours old. Fresh bread, especially that made from fine, white flour, forms a soggy, fermenting mass in the stomach, and is not only very indigestible, but furnishes a breeding-place for the germs of fermentation, resulting in sour stomach, colic and many other ills.

Whole wheat and whole wheat preparations, such as shredded-wheat, triscuit, etc., are excellent. Eggs, oatmeal, cornmeal, rice, and nearly all vegetables contain the lime-salts essential to bone-building. So, also, does beef. A simple diet , mixed, composed of the natural foods, will contain all of the elements necessary to good health and good teeth, provided they are well masticated, and provided also that digestion and assimilation are not impaired.

Experiments made over and over again prove that animals fed on poor foods, that is, such as are deficient in mineral salts of the kinds necessary to body-building, have poor teeth and weak bones; and that, if such foods are continued, animals will starve to death rather than eat it. In this the animals are guided by a sure instinct that no amount of "tasting good" can deceive.

Adding the necessary salts to the food artificially or giving them in doses as medicines does not alter the case in the least.

These experiments and their results apply equally to the child. If it is unable to obtain a sufficient supply of the necessary salts from a mixed diet of natural foods, the use of bone-meal, or the so-called bone-building drugs, is likely to prove of no avail.

Whatever promotes good health—air, sunshine, nutritious foods well chewed, hygienic surroundings at all times, plenty of sleep, good habits, tends toward the building up of good, strong, solid, healthy teeth.

Good teeth being acquired, good care is necessary in order to preserve them during life. If the teeth are not good, if they are soft, decay easily, or are lacking in any degree, they require even greater care than good teeth. With proper care, even poor teeth may be preserved almost indefinitely.

Until within the last few years dentistry has concerned itself chiefly with repairing the damage done to the teeth by decay, and with replacing them with artificial substitutes when too far gone to be saved.

To-day the aim of progressive dentistry is to prevent dental disorders rather than to cure them.

To keep the teeth clean, highly polished, free from all sharp angles, irritating deposits, fields for the production of pathogenic or disease-breeding germs, or whatever tends to invite disease or promote decay, is the most useful field for the exercise of the best skill of the progressive dentist. In other words modern dentistry aims to put the mouth into hygienic condition and keep it there.

The special method employed to bring about this natural, healthy, hygienic condition, and to maintain it after it has been brought about, is known as prophylaxis—oral prophylaxis. Oral refers to the mouth; prophylaxis means warding off or preventing disease; or that which makes for the preservation of good health. Oral prophylaxis then, means treatment that is efficacious in the prevention of dental disorders; of diseases of the mouth and the teeth, and of conditions in the oral cavity tending to cause diseases in other parts of the body.

So important has this preventive idea become in the minds of the dental profession that there are now, in many cities, prophylaxis specialists, who devote their entire time to the practice of this important branch of dentistry.

The creed of oral prophylaxis is that cleanliness is the salvation of the teeth; that a clean mouth and clean teeth mean a healthy mouth and sound teeth; and, as a natural consequence, a bettered, more resistant, physical condition generally.

Based upon statistics, it is estimated that 72 men, women and children die every hour in the United States from diseases that might be prevented; and it is now known that many of these preventable diseases have their origin in an unhygienic condition of the mouth and teeth.

The aim of oral prophylaxis is to do its share, and a large share, in the prevention of this needless loss of life; to bring about a condition of health and well-being so far as the mouth and teeth are concerned; to keep that part of the digestive tract that is under our control in a normal, healthful condition; and, with the help of the patient, to keep it there permanently.

How is the patient going to do his share in the work of maintaining the health of the oral cavity? Certainly not by the ordinary thirty-second-lick-and-promise cleaning indulged in by the vast majority of people who use the toothbrush.

In the first place, it must be understood that the purpose of the cleaning is not merely to make the front teeth fit to be seen, but to make all of the teeth, on all of their surfaces, positively clean. And this means intelligent and conscientious effort, regularly and faithfully applied.

To properly clean the teeth, begin by rinsing the mouth with salt water, about a teaspoonful of salt to a pint of water, warm or cold, as may be preferred, forcing it vigorously back and forth between the teeth. Do this with the same vigor and determination that you would put into doing anything that you thought would prolong your life, increase its happiness or usefulness, or increase your income. It is just as important as proper mastication, or as the proper setting of a broken arm.

After using the salt water, put a quantity of good tooth-powder into the palm of one hand, with the other moisten a good tooth-brush with the salt water, and dip it into the powder. Then proceed to SCOUR the teeth.

Use the tooth-brush as you would a scrubbing-brush on your kitchen floor or in your bath tub. Scrub your teeth; do not be satisfied merely to brushly lightly over the surfaces.

Do not use the brush crosswise of the teeth. You will only touch the high surfaces that are naturally clean, anyhow, and you may work great injury by sawing cavities in the teeth above the enamel, at the gum-line.

Begin at the gums on the upper jaw and brush downward; begin at the gums on the lower jaw and brush upward; inside and outside alike. As the inside or the tongue side of the teeth is harder to reach with the brush than the outside, more time and care are necessary to get them clean and keep them clean. As a lamentable matter of fact, it must be said that because they are not seen they usually get much less care. Ignorance on this score is much to be lamented. A wealthy, prosperous and successful man of sixty, recently stated that until he was well past fifty, he never had tried to clean the insides of the teeth, thinking that they did not need any care at all.

Scour the grinding surfaces back and forth, crosswise. Dip the brush into the powder often enough to apply it equally to all of the teeth, and remember that the surfaces that are hardest to reach need cleaning most.

Make the cleaning of the teeth as necessary to your comfort as the bath, or the washing of the hands and face. It is far more important. Take plenty of time. Ten to fifteen minutes per day is none too much time to spend at this most important work; make work of it; make it a duty. The teeth should have three to five cleanings each day, in addition to the thorough scrubbing described. Remember, that the mouth is a veritable breeding-ground for disease-

germs, and that they multiply with astonishing rapidity if undisturbed, while the raking and scraping given to them by the proper use of the brush, to say nothing of the frequent dosing with disinfectant germicides in the shape of tooth-powders and mouth-washes, prevent their increase almost wholly.

Two or more tooth-brushes should be used, of a rather small or medium size, preferably those with wedge-shaped points on the rows of bristles, as the points work in between the teeth, where most care is necessary. Use your brushes alternately, so that they will have a chance to dry out before used again. Never buy a cheap brush. And never use a brush, no matter how much you pay for it, after the bristles begin to fall out. An over-used, soft brush, is the poorest kind of economy. After using the brush, rinse it thoroughly in the salt water and hang it on the rack to dry. Any good mouthwash will do in place of the salt-water. Powder need be used in most mouths but once each day, preferably at bed-time, if used as suggested.

A larger proportion of the cavities in teeth start between them, where the brush, however skilfully used, can not reach. To thoroughly clean these spaces is, therefore, of utmost importance. For this, waxed floss silk, preferably flat, should be used. Insert between the teeth, and draw back and forth until all these surfaces are perfectly clean. Do this at least twice each day; better, do it after each meal.

It is no easy matter to teach the children to keep their teeth clean, but the necessity of the case makes it the duty of every parent to keep constantly at their children until the habit becomes fixed.

In spite of the best care we are able to give our teeth, deposits will slowly form on them in most mouths, and there will still be some decay. Therefore, it is necessary to visit the dentist at regular intervals. The frequency of these visits should be governed by the needs of the individual, and this should be left to the knowledge and judgment of

the dentist. In very few cases should these visits be less frequent than twice each year.

As to why teeth decay, an illustration may help to make the cause and process clear. If a drop of acid is spilled upon the marble top of a wash-stand, it boils and bubbles, and, if allowed to remain, will dissolve out the lime and leave the surface roughened. Nearly everybody is familiar with the experiment of soaking an egg in vinegar until the lime in the shell has been dissolved, and the egg, unbroken, then put into a bottle, having a neck half the normal size of the egg. Decay of a tooth is caused by a similar process of dissolving the lime.

The lime in the tooth is eaten by an acid. This acid is known as lactic acid, familiar to nearly everyone. It is the acid present in sour milk. Its presence in the mouth is due to the fermentation or souring of food particles adhering to and between the teeth.

In the mouth that is not cared for, the teeth are bathed in this acid practically all of the time, and all the time the acid is at work, dissolving out the lime-salts in the teeth, just as the acids do with the marble slab and the egg-shell. This shows why teeth start to decay at the points that are hardest to keep clean. It also shows why extra care should be taken to keep those points as clean as possible. Decay rarely starts on the exposed surfaces of a tooth.

Now, as to the structure of a tooth. A tooth consists of the crown (the part above the gum), and one or more roots embedded in the jaw. The outer coating of the tooth, the part that we see, is called the enamel. It is nearly all lime-salts, 98 per cent. It is very hard, very compact, comparatively thin, and has no nerves; therefore, it is without feeling. Its purpose is to stand the wear of grinding, and to protect the softer, sensitive parts of the tooth beneath. (***)

Beneath the enamel is the dentine. It forms the bulk of the tooth. It is only about three-quarters, 75 per cent.

lime, and is, of course, not so hard as the enamel. It is something like bone, having tubes and hollow places, within it, along which the germs of decay can spread and multiply without much resistance.

In the center of the tooth, surrounded by the dentine is the pulp, commonly but improperly called the nerve. It has a great many exceedingly fine, thread-like branches outwardly through the dentine, forming a very complete signal-service, the duty of which is to warn us when danger from decay or other source threatens the health and usefulness of the tooth. (Fig. 18.)

FIG. 18. ADULT. PROCESS AND PART OF ROOT CUT AWAY, EXPOSING ROOT CANALS.

A tooth that aches, after one has been eating, for instance, is a tooth in distress. Some of the little pulp-branches are exposed and are calling for protection. If they do not get it, the pulp itself will be calling next, and by that time the chances are that the labor, pain and expense of saving the tooth have been increased many fold.

Here is a case in which a stitch in time may save not only a great deal of suffering, but, by a simple, inexpensive filling, the tooth may be saved to usefulness and comfort. If, on the other hand, the warning is not heeded, the pulp, after protesting with all its might with some pretty severe aches and pains commonly called neuralgia and other things, gives up the fight and dies. Because the pain is felt not so much in that particular tooth as all over the face on that side, the tooth may not be suspected, and frequently physician's bills of large size are contracted in the vain search for relief.

Facial neuralgia, so-called, of this character and from this cause, is very common. Facial neuralgia from all other causes combined is very, very rare. Therefore, when suffering from neuralgia in the face, suspect your teeth, and at once consult the dentist.

It is a common notion that a tooth having a dead nerve or pulp can ache no more. This is a delusion. A dead tooth, like any other unburied dead thing, is dangerous, a menace to the health not only of the mouth, but of the entire body. It is a breeder of poisonous germs. If these poisons escape into the mouth, they are mixed with the food and the saliva and swallowed. And, in the case of mouth-breathers especially, the foul gases created are carried to the lungs and thence to the blood, paving the way for tuberculosis and a general undermining of the health.

To one who knows how vile a dead pulp becomes, the very thought of having one in the mouth makes him sick. And how are we to have pure air in our homes, our schools, our opera-houses, our churches, when, with every breath from such a mouth, these poisons are poured into the atmos-

phere? As a matter of simple self-protection, we should avoid inhaling the breath from such a mouth.

If, instead of escaping into the mouth, the poisonous gases get out through the end of the root, the tooth becomes sore, the face swells, pus is formed and bores its way, usually with great pain, out through the jawbone and gum, forming the so-called gum-boil. This pus is also a poison, a dead thing; and this, too, is swallowed, making a much more serious condition than generally is known, or may generally be believed. No one can long be well under such a state of affairs, a veritable poison factory within the mouth.

Many people are constantly ill, constantly under the care of the physician, doctoring for all sorts of troubles, who are simply the victims of blood-poisoning, due to neglected teeth. The troubles commonly called "nervous diseases" are largely due to these causes.

Every year thousands of preventable deaths occur from causes originating in the condition described, although very seldom is the true condition suspected by anybody—except the dentist. He doesn't suspect; he knows.

Offensive as is a tooth of this character and in this condition, and dangerous as it is to health and life itself, it may be restored to full usefulness, health and comfort. While it is very desirable to have the teeth frequently examined and all the cavities filled while small, a tooth is not beyond redemption and salvation even when nothing is left of it except the root, providing that root is firmly held in its socket. A root broken off level with the gums may be crowned so skilfully as to appear perfectly natural and defy detection, and it may be so applied as to be as comfortable, as serviceable, and, in many cases more lasting, than a well-cared-for natural tooth, that is perfectly sound.

Another disease to which neglected teeth are subject, is loosening, due to deposits of lime in the form of tartar, and to collections of decaying matter, which are allowed to

gather and remain on them. This causes the gums to swell, to become tender, to bleed easily, and gradually to waste away, together with the bony socket that holds the teeth in place.

This is a very serious condition, not only preventing the proper chewing of the food, because of the tenderness of the teeth and gums, but the teeth themselves become exceedingly filthy, and in many cases large quantities of very rank pus are being continually swallowed, the health being thus most surely and certainly undermined by the two enemies, which ably aid and abet each other, one by preventing proper preparations of the food by the teeth, and the other by converting much of it into rank poison.

If this trouble is attended to in its early stages, it may be removed and the loose teeth tightened and restored to perfect usefulness; but if neglected, the teeth finally will fall out, ending the chapter in disaster.

Here, again absolute cleanliness is the great preventive. Teeth that are kept clean can not possibly get into this distressing and often fatal condition. Here again, dirt, decay, degeneracy and death go hand in hand together.

This disease, in common with most of those to which human flesh is heir, is much more easily prevented than cured. Those who are threatened with it or suspect that they are should lose no time in putting themselves under the care of a competent dentist, and then follow religiously and rigorously the instructions given.

The expression, "My teeth are naturally so poor that I am going to let them go and have artificial ones," is very often heard from the lips of even comparatively young people; and, while it implies a compliment to the skill of the modern plate-maker, the thought back of it is usually a very unwise one to entertain, and the course a most foolish and unsatisfactory one to pursue. It is hard to imagine a set of natural teeth that are not or can not be made much more useful, satisfactory, sanitary and comfortable than the best

plate ever turned out of a dental laboratory. This attitude has been responsible for the heedless loss of millions upon millions of perfectly sound teeth. It has come down to us from the days of our grandmothers; and while, in those days it may have been justifiable, in these days of advancement in dental science and practice, it is so no longer, except in very rare and exceptional cases.

If the teeth really are too far gone to be saved, the sooner they are out and replaced the better; for, as stated, a mouth full of decayed and decaying teeth and roots is a menace not only to health, but to life itself. But let no one needlessly sacrifice his own teeth for artificial substitutes. Good as they are now, most necessary in their place, and much as many of us owe to the advancement in dentistry during these last few years, they are but poor substitutes at best.

You will be perfectly safe in trusting the judgment of a good dentist in such cases. The time has gone forever when a dentist would extract a tooth that might be saved, merely to satisfy the whim of a patient. Preservation and restoration of the natural teeth is the proper field for the exercise of dental skill; and few indeed, and daily growing beautifully fewer, are the dentists who do not recognize this fact, and conduct their practice accordingly.

Another cause of poor teeth, crowded teeth, mal-formed jaws and unbalanced faces, with ill health and all the attendant train of suffering and inefficiency, is mouth breathing, due to a growth in the nose called adenoids. This is quite common in childhood, and is very easily remedied; but, if neglected, means a weakened, impoverished body, subject to coughs and colds, throat and lung troubles leading on to tuberculosis. Time will not permit going into this important topic in detail, but it is the duty of parents to watch their children, particularly while sleeping; and, if mouth-breathing is found to prevail, to consult a physician at once.

Sucking thumbs and fingers in early childhood, the use of "baby comforters," rubber nipples or other objects held between the teeth, often produce serious deformities of the growing jaws, and should be avoided with far greater assiduity than contagion from the simple diseases of childhood. (****)

Just a few words in conclusion:

Don't forget that the first teeth are just as important while they last, as the second teeth, if not more so, for the position, soundness and value of the permanent teeth depend, very largely, upon the care that the first teeth receive.

Don't forget the number of the first teeth; twenty in all, ten in the upper jaw, ten in the lower jaw, five on either side in both jaws.

Don't forget that the sixth tooth, the six-year molar, is a permanent tooth, and is the largest and most important tooth in the entire set.

Don't forget that clean teeth do not decay; that a clean tooth can not decay; and therefore, always remember to make every effort to keep the teeth clean—all of them, on all their surfaces, all the time.

Don't forget that clean teeth, well cared for, and food well chewed, are essential to good health, a sound body and a strong mind.

And do not forget that you are quite welcome to ask any questions on the subjects mentioned, if everything that has been said is not perfectly plain, simple and clear to you.

Stars (**) indicate the advisability of introducing slides at points where they appear; or the slides may be left until after the lecture is concluded.

OUTLINED LECTURES BY DR. STEVENSON.

Dr. A. H. Stevenson, published in *Oral Hygiene* the following outline lecture, used by the Committee on Public Health and Education of the Second District Dental Society of New York:

In order to obtain uniform results, we prepared lecture outline forms to cover our most common types of audiences. Three of these I append. They are merely guides for the lecturer, and give him ample opportunity for originality, as may be seen.

FORM I.

OUTLINE OF LECTURE TO MOTHERS' CLUBS.

The following points seem to be the ones that need the most emphasis:

1. Show that the Subject of Mouth Hygiene is not simply a hygiene of the teeth alone, but of the body, and that the responsibility for the general health of the child depends mainly upon the mother, and she should have sound ideas of how to conserve the child's health.

2. Bring out the influence that sound, clean teeth have upon the general health of the child.

a. Show how diseased and unclean teeth play a large part in the causation of disease. That the method of infection in the following diseases is chiefly through the mouth: Tuberculosis, pneumonia, influenza, la grippe, diphtheria, measles, scarlet fever, mumps.

b. Show how lack of, decay, or irregularity of the teeth cause mal-nutrition, mouth-breathing, adenoids.

c. Show how the pain of diseased teeth may be reflected to the eyes, ears, face, neck, head, and other parts of the body.

3. Show how the temporary teeth develop and then the permanent ones. (Use Charts.)

The use of cotton on the newly erupted teeth of infants.

4. Show the importance of preserving both.

Lay particular emphasis upon the *six-year molar.*

5. Function.—Tell how the teeth improve with use and advantage of thorough mastication.

6. Conclude with general mouth hygiene, as follows:

Articles required:

Brush—Size and shape, cautioning against too large a size.
Floss—How to use.
Dentifrice—Warning and advice.
Method of Brushing—Circular motion, including gums as well as teeth.
Frequency—After every meal and before retiring.
Rinsing—With lime water solution.

N. B.—Use simple language and avoid technical terms. At the close of the talk invite the mothers to ask questions.

FORM II.

OUTLINE OF THIRTY MINUTE TALK TO CHILDREN.

1. (For boys.) Show how success in sports and life depends upon good health.

(For girls.) Show how success in singing, reciting, or any public appearance depends upon good health.

Show that good health is impossible without clean mouths and good teeth.

2. Explain the relation of sound, clean teeth to strength, endurance, grace, beauty, and class-standing.

3. State briefly how decay is produced and how it extends, using illustrations, if possible.

Show that gelatinous placque precedes decay, and that destruction of placque means prevention of decay.

4. Emphasize the importance of preserving the temporary teeth, and the sixth-year molar.

Introduce phrase, "A clean tooth never decays."

Have children repeat it in unison.

5. Explain the dangers of bolting food, and the advantages to the teeth and body in general, of thorough mastication.

6. Conclude with general mouth hygiene, as follows:

Articles Required:

Brush—Size and shape, bristles. Caution against very large brushes.

Floss—How to use.

Dentifrice—Warning and advice.

Method of Brushing—Demonstrate circular motion.

Frequency—After every meal and before retiring.

Rinsing—Using lime water solution.

FORM III.

OUTLINE OF LECTURE TO NURSES AND PHYSICIANS.

The following points seem to be the ones that need the most emphasis:

1. Show how unclean mouths are ideal mediums for the proliferation of bacteria, there being present necessary elements: Moisture, Darkness, High Temperature, and Pabulum (or the debris). The last can be avoided. Indicate the following as diseases whose main means of infection is the discharge of the mouth. Tuberculosis, pneumonia, influenza, la grippe, diphtheria, measles, mumps.

Show how lack of, impairment or irregularity of the teeth cause mal-nutrition, mouth-breathing, adenoids.

2. Give brief histology and development of the teeth, temporary and permanent, showing how calcification proceeds and dietetic influences. (Use Charts.)

Discourage the use of glass tubes for administering drugs, and advise capsule or tablet form for all administrations of tinc. of ferric chloride. Emphasize that dilution increases destructive strength of this drug on the tooth structure.

3. Show prevalence and nature of dental caries as a disease itself, and conditions favorable for its inception and increase. Show how reflexly disorders of the eye, ear and brain may result.

4. Give general mouth hygiene for normal conditions indicating:
Articles Required:

Brush—Size, shape and bristles.
Floss—How to use.
Dentifrice—Warning and advice.
Method of brushing.
Rinsing—With lime water solution.

5. Give the application of the hygiene by nurses, emphasizing:

a. The preparation of patients for operations (through oral asepsis).

b. The care of the mouths during pregnacy. (Beware of extreme oral acidity.)

c. The care of the mouths of children. (See Form I.)

d. The care of the mouths of invalids and convalescents. (Rigid hygiene.)

6. Conclude with the importance of strict oral cleanliness on the part of the nurses as a safeguard against infection for themselves, and those for whom they care.

FORM IV.

OUTLINE OF LECTURE TO KINDERGARTEN CHILDREN.

Open talk with either story* or demonstration† to attract attention, and then proceed with the following:

1. Describe graphically the doorway and vestibule of a house, and the effect on the interior of that house, be it ever so neat and clean, of a dirty entrance with children passing in.

2. Show the analogy of the mouth as the doorway and vestibule of the body, and the effect on the interior of the body of an unclean mouth with food passing through and carrying filth into the stomach.

Results: Disease and illness; loss of play and school.

3. Ask how many children washed their faces before coming to school. (Usually unanimous.) Then show the importance of cleaning the "inside of the face," in order to be clean and well.

4. Very briefly, with a large model, if possible, show the alignment of the teeth. Promise that if they keep them clean they will stay pretty and white as snow.

5. Conclude with simple mouth hygiene, demonstrating with giant tooth-brush on model, and emphasize the frequency of this operation and the use of a dentifrice.

*Example.—Ask the conundrum: "Twenty white horses on a red hill, here they go, there they go, now they stand still." Answer—The teeth.

†Select a precocious-looking child and with a new brush show him how to brush his teeth, while the others are looking.

FORM V.

SYNOPSIS OF PUBLIC LECTURE.

MOUTH HYGIENE.

I take it for granted that all want to live to a good old age.

There are men throughout this country who are trying to prolong life—your life—by preventing disease.

It is a significant fact that there were but sixty-one persons who died last year to every one hundred who died in 1878, thirty-five years ago, a saving of 44,115 lives in New York City alone.

To do real damage, disease must enter the body. How do most of the contagious diseases find their way into the system? Through the door-way—the mouth.

It is common knowledge that disease germs can neither thrive nor survive unless unclean conditions exist. How is it in your mouth?

There are three things necessary to sustain life—food, water and air. All of the food, all of the water and part of the air enter the body through the mouth. Hence, the importance of absolute cleanliness at all times.

The effect of the most stringent pure food law is lost unless the mouth is clean, as the law does not control the food after it has passed the lips. If allowed to remain in the mouth, food becomes polluted worse than any form of adulteration.

Wherein lies the remedy? In practical mouth hygiene.

HYGIENE.

Clean the mouth oftener and clean it better.

Brush the teeth whenever they are unclean, after every meal and the last thing at night.

The brush should not be too large, and should be slightly curved, as is the arrangement of the teeth. Medium stiff bristles will be found best for most people.

Dentifrice (powder or paste) should not be too gritty.

Dental floss should be carefully used for interspaces.

In brushing use circular motion, including gums as well as teeth, and remember that there are inner as well as outer surfaces.

Masticate thoroughly, for, like the muscles, the teeth improve with use.

These rules of mouth hygiene, although simple, are effective. Make them a habit and increase your immunity to disease.

FORM VI.

SUGGESTIONS FOR BRIEF TALK TO BOY SCOUTS.

Commence by referring to the great *Enemy* of the Human Race, *Disease*.

Compare this *Enemy* to an invader during a campaign, and point out how a General defending a city would fortify the gateway first. Thus bring in the Mouth as the gateway to the body.

As the soldier has weapons and powder, show that we have weapons (brushes) and powder, and that the intelligent use of same results in the destruction or crippling of the Enemy, Disease, in this region.

In this manner build up a respect for the oral cavity, and at the conclusion of talk demonstrate the Tooth Brush Drill.

When possible it is wise to have the boys notified to bring their brushes for the occasion, and a few taught the drill in view of the rest, the entire troop finally performing it.

LECTURE BY DR. ALBRAY.

Forceful illustrations count for more in a popular lecture before a general audience than do statistics or pictures of anatomy. For an audience of girls or ladies, what could be more convincing than the following extract from a lecture by Dr. R. A. Albray, published in the *New Jersey Dental Journal*:

Teeth are for use and that use is to break up the food, incorporate the saliva with it, and so begin the process of digestion. The proper mastication of food is the first step toward its digestion and subsequent assimilation. The food is the material which nourishes and sustains the body, it becomes part of the body itself. Do you not see then how important it is that this food be properly prepared by the teeth for the further processes of digestion? In making a cake you would not put your flour, butter, sugar, baking-powder, eggs and flavoring in a pan and then into the oven, without properly mixing it, and expect it to be a good cake. All of the ingredients are there for a good cake, but unless the mixing process is properly done, some one of the family would want to know when bricks had been added to the menu. Just so with the body, you can give the child, or the adult, plenty of good food, and the ingredients are there to nourish the body, but if the mixing is not properly done the result is like the cake, not as good as it might have been. During childhood the bodily weight must not only be sustained, but it must be greatly increased each year. We adults have only to assimilate enough food material to replace the tissue lost by use. How much more necessary then is it that the child's digestive system be in good working order?

If a child comes to school and is found to have head lice, the school physician or nurse is immediately concerned and prompt measures are instituted to correct the trouble, when about the worst these little creatures can do is to cause a good big case of itch. If another child has a conjunctivities, home it goes until it is cured; another may have a ring worm or a dirty face, but until the condition is corrected to the satisfaction of the school authorities, the child can not return to school. This is all very fine and I have nothing but commendation for the medical inspection. But what of the child with a filthy, dirty mouth, full of active, disease-producing bacteria; foul breath polluting the school room,

and every cough or sneeze sending bacteria into the air by the thousand? Why, in most communities it stays in school and makes a present of these "bugs" to the other children. Nothing is thought of it; dirty, unsanitary mouths are the rule, most people have them, and most of them would rather spend an hour in washing the face, combing the hair, and manicuring the nails, than to spend a few minutes with a tooth brush, and an hour or so in the dental chair every few months. All vanity and ignorance. The state of the mouths of the school children is deplorable, and the only remedy is to educate them to a realization of the necessity for its correction. Daily brushing of the teeth, regular visits to the dentist, combined with dental inspection in the schools, with the inspector invested with the authority to compel the child to have its mouth put in a sanitary condition is imperative, and it is the only way in which the health, physical, mental, and moral ideals of development can be attained.

CHAPTER IV.

POPULAR LECTURES—CONTINUED.

AN ILLUSTRATED LECTURE BY DR. ZARBAUGH.—LECTURE FOR SCHOOL CHILDREN FROM FOURTH TO EIGHTH GRADE, BY DR. CORLEY.

If it is convenient to obtain the lantern and proper slides, the following lecture by Dr. L. L. Zarbaugh, can be used to advantage. The cuts suggested are easily made and show to good advantage. While the article was written on the subject of "Moving Pictures in Dentistry," I have moved it around a little so that it will fit the subject.

AN ILLUSTRATED LECTURE BY DR. ZARBAUGH.

Open with a home scene, showing family group, children playing or reading, mother sewing or darning, father reading the evening paper. He reads an article, "The time to begin to care for teeth is in childhood," etc. Father calls mother's attention to the article, which is then shown on the screen. They then look at the children's teeth, and decide then and there to instruct the children in the care of their teeth.

Next is shown a dental nurse or dentist instructing the children in the proper manner of caring for the teeth, the use of dental floss, the *folly* of blunt wood toothpicks, etc., the correct method of brushing the teeth, etc.

Then follow with a short, "cute" picture of "the baby" brushing his teeth, as the dentist has directed.

Other subjects will be the interior of a school-room, showing the examination of school children's teeth, showing

that the instruments are sterilized after each child—a near view of just how it is done; also showing a near view of 20 boys and girls, showing only the mouth and teeth, and pointing out the decayed teeth in each mouth and other defects as they exist.

Show the number of percentage of 20 children needing dental services. It should be vivid and convincing, and will go a long way towards removing the prejudice existing in the minds of many members of school boards and teachers against it. This part of the lecture will awaken such an interest on the part of the public that they will demand the examination of school children's teeth—the very thing we are striving for; and the best way to get into the schools is to create an interest in the public mind, which will soon grow into a demand.

Then show a near view of an unhealthy mouth, loose teeth, tartar, pus, etc. Move the loose teeth with an instrument; show the ruin that neglect will cause in a mouth; then show this same mouth as it will appear a short time later, unless cared for, as barren of teeth as the mouth of a new baby.

Next show the *progress of decay,* by picture or blackboard illustration, in a tooth from the very start until the death of the dental pulp, the breaking down of the enamel, etc. This will be done mechanically; the decay will be seen *moving* towards the pulp; the period or time at which the tooth begins to ache will be pointed out, etc. Some of the text, no doubt, will be along the following lines: (Fig. 19.)

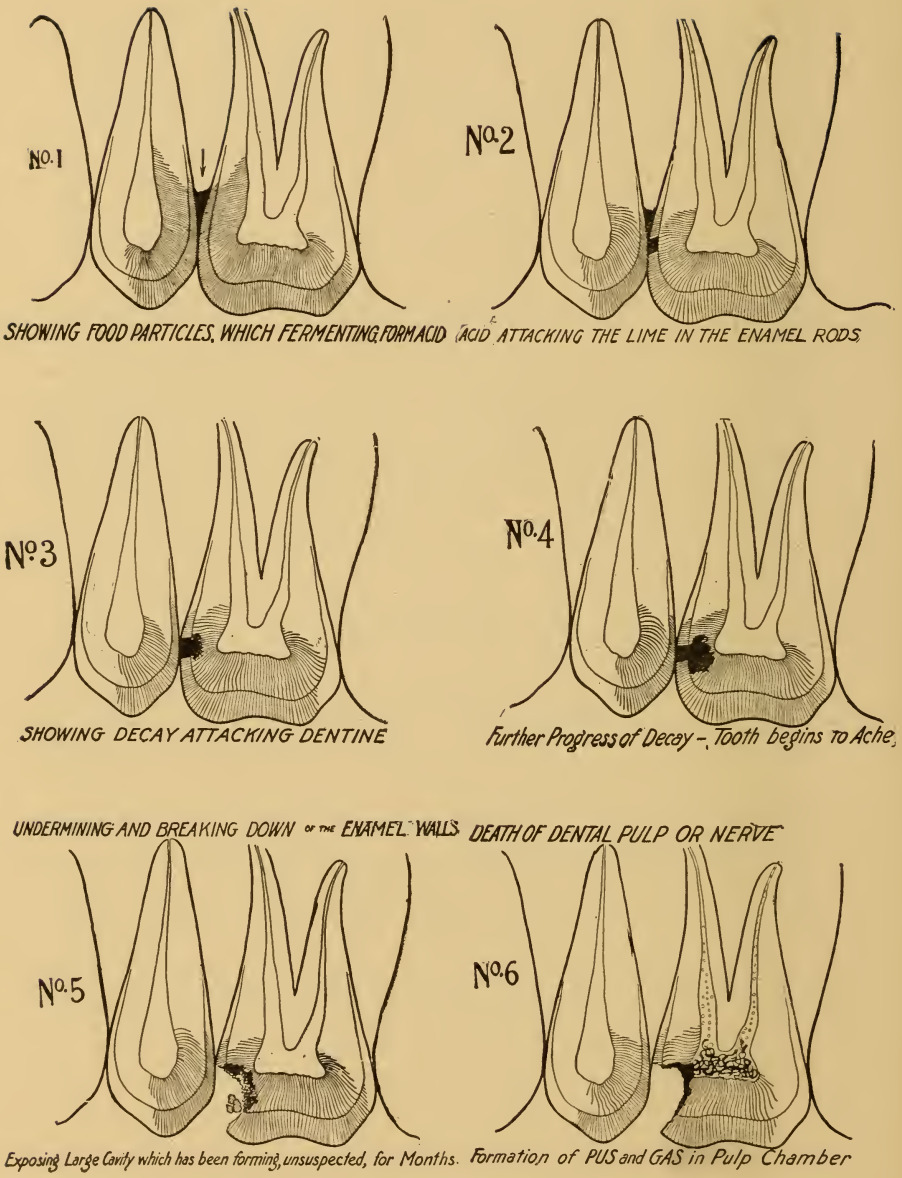


FIG. 19. SHOWING THE VARIOUS STEPS IN TOOTH DECAY.

No. 1. Uncared for teeth, showing food particles, which, fermenting, form acid.

No. 2. Showing the acid attacking the lime in the enamel rods.

No. 3. Showing decay attacking dentine.

No. 4. Showing further progress of decay; *tooth begins to ache.*

No. 5. Showing undermining and breaking down of enamel walls, exposing large cavity which has been forming, unsuspected, for months.

No. 6. Showing death of dental pulp, formation of gas, pus, etc., in pulp chamber; escape of gas at apex, swelling, abscess, etc.

It has been suggested that inasmuch as we show the death of the pulp, for a change, and to give the people a chance to relax a little, we show the *funeral* of a dental pulp, with the owner of the tooth as chief mourner. Worked up properly it would be very funny and make the people in the theatre wonder just how long they will dare to wait before they, too, will have a funeral of their own.

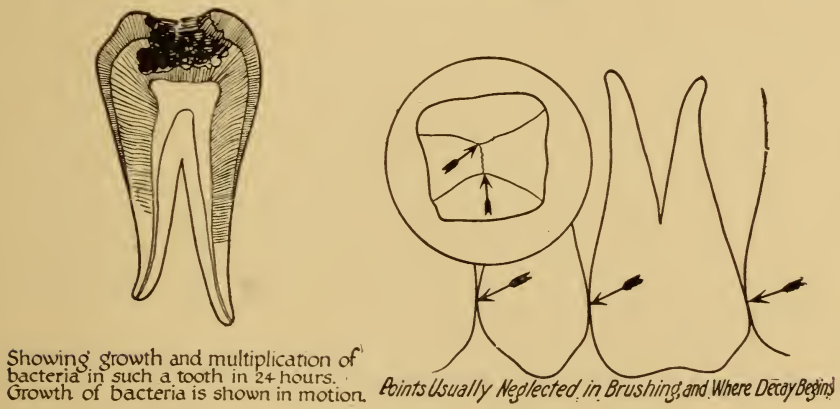


FIG. 20. SHOWING THE STEPS IN TOOTH DECAY.

Fig. 20. A badly decayed molar, showing the growth of bacteria in such a tooth in 24 hours. The multiplication of germs also will be shown in *motion* and will teach such a

lesson that anyone seeing it, who has a decayed tooth, will not go to bed without making some effort to *clean it up.* When we consider the appalling rapidity with which bacteria multiply we can realize how interesting this picture is sure to be. According to Conn, professor of biology at Wesleyan University, "it is the power of multiplication by division that makes bacteria so significant. This power of growth is almost incredible. Some species divide every 30 minutes, or even less. At this rate each bacterium would produce, in a single day, more than 16,500,000 descendants; in two days about 281,500,000,000, or about one solid pint. At the end of the third day, unless checked, the product of one original bacterium would weigh about 16,000,000 pounds. Of course, this growth is only theoretical, as under no conceivable bodily conditions could it go on unchecked."

Tell about a boy *who would not clean his teeth;* show him going to bed with the toothache (making a striking example of him), show the usual fuss, hot water bottles, etc.; then show a dream that he has while in bed; he dreams of a trip to the dentist, as he *supposed* it would be. Very funny, of course, yet so arranged as not to bring criticism on the profession or detract from the real purpose of the lecture. Then after the nightmare, a trip to the dentist as it *really was*; show him treated kindly and relieved of his suffering, etc. State that *fear* and ignorance cause more pain and keep more people from visiting the dentist than any other one thing.

Next tell the good resulting from care of the teeth; show a healthy mouth from childhood to old age; show teeth without a blemish, every one sound, without even a filling. This, too, will teach a great lesson and make a lasting impression.

LECTURE FOR SCHOOL CHILDREN FROM FOURTH TO EIGHTH GRADE.

Compiled by Dr. J. P. Corley.

Star (*) indicates the advisability of introducing slides at points where they appear; or the slides may be left until after the lecture is concluded.

We have a great many good things in this life, but the greatest possession of all is good health. Health is more important to children than to grown up people, because if one is not well while he is growing, he will not have a strong vigorous body when he becomes grown up, and he will be more apt to have all kinds of diseases during the rest of his life.

Clean, wholesome, well-prepared food has more to do with the health of a child than any other one thing. If food is clean and wholesome, but is taken through a mouth which is unclean and unwholesome, it will not be clean and wholesome when it goes into the stomach.

(*) This first picture shows a man with his front cut away, showing the canal through which the food passes into and out of the body. The large hole which we see at the top of the canal is the mouth. If the food is clean and the mouth is clean our stomachs will get clean food, but if the mouth is filthy, the food will surely be made filthy before it is swallowed. A great many germs, such as diphtheria, scarlet fever, typhoid fever, and tuberculosis, are frequently found in mouths which are habitually unclean and full of decayed teeth.

Some times, after a person gets well of a disease, he will carry the germs of this disease in his decayed teeth, and by spitting, and various other ways, give the disease to other people.

(*) This is a toothless pair. Old "Mammy" has lost all her teeth and the "baby child" has not gotten hers; at least, we can't see them, but if she should scald her little mouth bad enough for the gums to come off, we would see

a row of sacks just under where the teeth will peep through when they come into the mouth.

(*) Just inside of this row of sacks there is another row of smaller sacks. If we should slit open one of these sacks what do you think we would find? The top of a beautiful little tooth like a bulb, which in the spring time peeps up through the ground and opens into a beautiful flower. This tooth is pretty and clean and hasn't a decayed spot about it, and if it is kept clean as long as it remains in the mouth, it will never decay. The baby ought not to suck her thumb or keep a pacifier in her mouth all day, because this will mash these little sacks out of place and will make her teeth crooked. (*) It will also change the shape of the soft bones of the front of the face and make her little nose turn up like this. (*) So, if you don't want the baby's nose to turn up, you had better tell your mother not to let her suck her thumb.

(*) The picture on the left shows the upper part of the mouth of a child two and a half or three years old, with all the first set of teeth in place. You see that they are all sound and regularly arranged. There is never a crooked or misplaced tooth in the first set, but there are frequently misplaced teeth in the second set. The most common cause is that the mouth and jaws have not grown large enough for the second set. Chewing is what makes the jaws grow, so if your teeth are crowded and crooked, it is because you didn't chew with your first set. Sometimes, as we will see in a moment, other things keep the jaws from growing and misplace the tooth, but the lack of chewing is the main cause. The picture on the right shows the same case at about six years old. It has another group of teeth. They belong to the second or permanent set. If you lose these you will never get others to take their places. They are called the sixth-year molars, and are the largest and most useful teeth in the mouth. They are more frequently decayed than any others for the reason that boys and girls at

six to nine years don't usually keep their teeth clean. The mother usually thinks these teeth are part of the first set, and thinks it does not make much difference if they are lost, but we will have more to say about these teeth in a moment. You will notice that one of the front teeth is missing. Do you suppose the dentist had to pull this tooth because it ached? No.

(*) It just dropped out and "didn't hurt a bit." I am going to show you why it dropped out.

(*) In this picture the bone has been cut away from the root of the temporary teeth and we find that just above each little temporary tooth there is a big permanent one. The permanent tooth comes down upon the end of the temporary tooth and nibbles it off as a mouse nibbles cheese, so that by the time the permanent tooth gets ready to come into the mouth the temporary tooth has lost its root and drops out. But I am going to tell you something which I want you to tell your mothers. If the temporary tooth is allowed to decay until it aches, the permanent one will stop nibbling and you will have to go to the dentist and have him grind it down to the gums so that the new tooth can push it like you would drive one nail out with another. This is one reason why the temporary teeth should be kept clean and free from decay. Another reason is that you can't chew so well if your temporary teeth are decayed. Your jaws will not grow and be large enough for the permanent teeth, and you will suffer from indigestion and its consequences. It will also be impossible to keep your mouth free from germs and the new teeth will decay as soon as they come in.

(*) When one is four years old the teeth are close together, but if the jaws are properly used in chewing, they begin to separate as the jaws grow, so that by the time one is six years old, the teeth do not stand apart as they do in this picture.

(*) The dentist should put in a little appliance to spread the arch, otherwise the permanent teeth will be crowded.

(*) This man didn't chew his food when he was a boy. I guess he just gobbled it up with both hands like this (Illustration), so his mouth didn't grow and his teeth were all awry. His mouth and face didn't grow either, so he had a big head and a little pinched face.

(*) This man chewed his food when he was a boy, and when he grew to be seventy-five years old, he had all his teeth and was a good-looking, hearty old man. I guess he just chewed and chewed and chewed, until the food just swallowed itself. You needn't bother about swallowing your food. After it has been sufficiently ground, it will slip down without any effort.

(*) This is the lower set, and they are just as fine as the upper. Those dark lines which you see marking the tops of the back tooth are grooves, which divide the top or grinding surface of the tooth into points and depressions. By this arrangement the free surface of the tooth is increased and its unevenliness makes it a much more efficient grinder.

(*) This is the same case with the teeth brought together. Notice how beautifully they fit, and also that each upper tooth touches two lower ones. Which one of these teeth could one afford to lose?

If you should saw through a front tooth and through the gum and bone to the end of the root, you would find that the tooth is made up of four different substances. The one which covers the top is enamel, and it is the hardest organic substance in the world except diamond. The next substance which makes up the bulk of the tooth is dentine, which is not so hard and wears and decays more rapidly. Encasing the root is a still softer substance called cementum. Occupying a canal in the center of the tooth is the pulp, which is composed of blood vessels and nerves. When decay makes a hole through the enamel and dentine into this pulp, the tooth begins to ache. Surrounding the root and attaching it to the gum and bone, is a thin membrane—the

peri-cementum. If you allow tartar to accumulate on the teeth and remain for a long time, it will destroy this membrane and the tooth will loosen and drop out. Teeth are lost mainly in two ways—by decay, which destroys their crowns, and by disease of the gums and destruction of the peri-cementum. Both of these causes can be prevented by yourself, and I am going to tell you how you may do it. We will first tell you how to avoid diseases of the gums.

(*) If you will examine your teeth when you first get up in the morning, you will find them covered with a thin, soft, yellowish deposit, which you can scrape off with a tooth-pick and examine. It looks like cream, but it doesn't taste like cream and it doesn't smell like cream. It is composed of epithelial cells, which shed from the lining of the mouth, mucus and microscopic granules of lime from the saliva, and if the mouth has not been cleansed of food before retiring it will contain decayed particles of food. If you do not brush this deposit off carefully before eating, the food will strip it down over the tooth and pack a little ring of it under the free margin of the gum. If it is allowed to remain there for a very long time, it becomes so hard that only the dentist can remove it, and it will cause the gums to inflame. A little is added to it every day, and by and by the entire root will be covered and the gum destroyed.

(*) This is practically the same thing which causes disease of the gums.

(*) See this deposit on the side of the tooth on the right. In the picture on the left, this deposit has been removed, showing how much of the membrane has been destroyed.

(*) The tongue side of the lower front teeth is the most favorite place in the mouth for the accumulation of this deposit, partly for the reason that a great quantity of saliva is poured out at this point, but principally because these surfaces are not properly brushed.

(*) This shows a deposit on the cheek side of the upper back teeth, which is also a surface not usually reached with the brush.

(*) After the gums have gotten as bad as this, there is no way to save the teeth, and they will soon be dropping out. Remember that this disease of the gums can be prevented by thoroughly brushing the teeth twice a day. We will show you in a moment how to brush them thoroughly. Let us now take up decay, which is the other great disease of the teeth, and we will then show you how both may be prevented.

(*) If you will examine the tops of the back teeth immediately after eating you will see that the little grooves which mark their surfaces, are filled with food. At first the food is granular and may be removed easily. Usually a vigorous rinsing of the mouth is all that is necessary, but if it is not removed at once it begins to ferment and develops a muculaginous condition, which makes its removal much more difficult. During the process of fermentation, an acid is produced which dissolves the enamel. This is about the only thing which causes teeth to decay. Hence, if no food be allowed to remain in the mouth until fermentation occurs, there will be no tooth decay.

(*) In tooth No. 1 the decay is very small. The point where it made its way through the enamel is scarcely larger than the head of a pin, but you can see that it is much larger in the dentine than it is in the enamel. This is because the dentine decays more rapidly than the enamel. A cavity can be prepared for filling at this stage with little time, pain and expense, as shown in Fig. No. 2, but if you wait until the cavity becomes large, as is shown in No. 3, it requires much more time, hurts much worse, costs a great deal more and does not last so long. Hence, the teeth should be examined several times a year by a dentist, and every decayed spot which is too deep to dress out, filled while it is

small. Tooth decay never gets well, but always gets worse, so the sooner the cavity is filled, the better.

(*) These pictures show the history of a tooth from the beginning of decay until the development of an abscess and the establishment of a fistula, commonly called a gum boil. (Go more or less into the details of the different steps of the process and the changes which take place in the pulp, giving a few facts pertaining to the proper treatment of such cases with special emphasis on the importance of retaining the tooth.)

If the residue of food is not removed after each meal and the last thing eaten something soft and sticky, as is too frequently the case, the mouth will sooner or later present the appearance of this one with cavities between the teeth and in the depressions in the tops of the back teeth, and unless dental attention is given this case, the teeth will soon be aching and breaking down like the ones in the next slide.

(*) Some of these teeth have broken so badly that they are worthless as grinders, they are liable to ache at any time and develop abscesses, they are so many garbage cans infesting the saliva which is constantly being swallowed and contaminating all food and drink. A mouth in the condition of this can not be otherwise than filthy and a great menace to the health of its possessor and its neighbors.

(*) This is a side view of the same case with the teeth brought together as in chewing. It shows what an enormous amount of grinding surface is lost. But even though your teeth are as badly broken down as these, you should not pull them out. Their tops can be restored by fillings, inlays, and crowns, so long as the roots are strong, which is immensely better than artificial substitutes. Some grown up people may tell you that it makes little difference if you lose this first permanent jaw tooth before you are fifteen years old, because the space will soon be filled up by the next tooth coming forward. Well, the space does fill up.

More's the pity. It would be better for you if the space didn't close up. Let me show you how the space closes up.

(*) The teeth behind the space lean forward, and lean forward, and lean forward, and the tooth in front of the space leans backward and leans backward, until their top corners almost or quite touch, thus closing the space at the top, but not at the bottom.

In thus leaning toward each other, their touching surfaces are so turned that they fail to touch the upper teeth in chewing and their fit in is entirely spoiled. The bone buckles as the teeth lean, so instead of losing the use merely of the tooth extracted, you also lose one-half to two-thirds of the grinding efficiency of all the grinding teeth on that side of the mouth. But this is only one of the many consequences of losing this tooth in early life. It causes a general warping of the bones of the nose and front face, which often helps to produce catarrh and a number of other diseases which we have not time to mention. It is safe to say that the loss of this tooth in early life shortens a man's days on an average of four or five years.

If the tooth is so badly decayed that only the roots are good, those roots ought to be treated and filled and kept in place until one is at least twenty years old. You may do anything that your dentist tells you to do except have this tooth pulled. If he insists on pulling it, then you should tell your mother that you have a poor dentist, and ask her to let you go to another. It is very seldom that even a temporary tooth should be pulled with forceps, and no permanent teeth, except the wisdom tooth, and seldom that should ever be pulled. If you forget everything else in this lecture, don't forget what I have said about this first permanent back tooth. Remember that it is yours at six years of age and does not replace a baby tooth, but comes behind the last baby back tooth.

(*) This picture shows how much better a man who has not lost this tooth can chew than one who has. One has at least one-fourth more grinding efficiency than the other.

(*) When this fellow was a boy, he didn't chew his food or brush his teeth, so they soon decayed and ached. He had two of his upper teeth pulled. His upper jaw stopped growing, but his lower jaw kept on growing, so when he got to be a man his teeth didn't fit each other and his jaws were not the same size. His chin protruded like this (Illustration), and he looked like this.

(*) Do you want to look like that? Well, you had better not have your teeth pulled out.

(*) This is the kind of dentist who pulls teeth! If your dentist looks like this you had better change your dentist.

(*) This picture shows how the adenoid tissue in the naso-pharynx sometimes becomes enlarged and stops up the air passages, so that you can not breathe freely through your nose. This makes you more susceptible to nose, throat, and lung trouble. It should be removed as soon as discovered. If you are accustomed to sleep with your mouth open and breathe through your mouth while awake, you had better have your physician examine you and see if you have adenoids, and if you have, they should be removed. They frequently spoil the shape of the mouth and make the teeth crooked.

(*) This is the way the teeth frequently look when one has had adenoids. If your teeth are irregular like these, you should go to the orthodontist (the dentist who straightens teeth) and have them straightened. It can be easily done while one is young, but if you wait until you are old, it is very difficult.

(*) These pictures show how the face looked before and after straightening the teeth. The teeth are much more easily and thoroughly cleansed, and are therefore much less liable to decay if they are regular and straight and fit each other properly. They are also much more efficient grinders. The first thing for you to do is to see a dentist and have him remove all deposits which you can not brush off, fill all cavities and put your mouth in perfect order and show you how you may keep it so.

In making the dental toilet, the first thing to consider is the brush. Any kind of brush is better than no brush, but the one at the bottom of this picture is too large. Well, it is not too large to brush the cow's teeth with, but if you don't weigh more than two hundred pounds, it is too large for you. If you have a new brush as long as this one, you can improve it by shaving the bristles off for about the length of the brush. You will then have all the brush that you will be able to use. The brush at the top is excellent. It has a long tuft of bristles on the end which enable you to reach the back sides of the last back tooth. The narrow nose, broad base and short body makes it adaptable to the various situations and the curve of the handle is an advantage. Brushes are made in soft, medium and stiff bristles. You should use a soft brush.

The next consideration is a tooth powder. Most all tooth powders are made of the same thing—Precipitated Chalk. They vary mainly in the perfumes and aromatic and antiseptic which they contain. If you get your mouth clean you don't need a perfume. Perfume in a dentifrice is a disadvantage, because it deodorizes the mouth and deceives you. A pungent aromatic does the same thing and interferes with the exquisite sense of touch and taste in the tongue, which is the sanitary officer of the mouth, and you may think your mouth is clean when it is really only deodorized. If you can get your mouth perfectly clean, you do not need an antiseptic, whereas, if you fail to cleanse it thoroughly, an antiseptic is of slight and transient value.

Pass the brush as far back in right buccal pouch as possible, place high up on the gums above last upper back tooth and bring downward with a rotary sweep.

You will see that as the bristles slide off the gums onto the teeth, they separate and sweep out the triangular spaces about the necks of the teeth. Now let me ask the girls a question: "If you were going to sweep the floor of a street car, would you sweep it across the car or down towards the

end of the ear? When you are sweeping the teeth to get them clean, will you sweep across the teeth or down towards the end of the teeth?" You may think that hard, but just to show you that it is not, I will brush mine and let you see. (Illustrate.)

Place bristles of brush on cheek side of upper right molar gums and sweep downward five strokes. Move forward to bicuspid region and repeat. Go back to cheek side of lower molar gums and sweep upward five times. Move forward to bicuspid region and repeat.

Place brush high up on tongue side of left upper molar gums and sweep downward with a rotary stroke five times. Move forward to region of bicuspids and repeat. Place brush on tongue side of lower molar gums and move upward five times. Move forward to bicuspids and repeat.

Take brush in left hand, place brush high up on cheek side of upper left molar gums and sweep downward with rotary stroke five times. Move forward to bicuspids and repeat. Place brush low down on cheek side of lower molar gums and sweep upward. Repeat for bicuspids.

Place brush on tongue side of right upper molar gums and rotate downward. Same for bicuspids. Same for lower molars and bicuspids. Change brush to right hand.

Place brush high up on lip side of right upper canine gums and sweep downward, working around to left canine. Pass to lip side of lower left canine gums and sweep upward working around to right canine.

Place brush high up in roof of mouth and sweep forward and downward over right canine. Work around to left canine.

Place brush well under tongue and sweep forward and upward over left canine. Work around to right canine.

Place brush back on grinding surface of right upper molars and sweep back and forth to bicuspids. Same on left upper molars and bicuspids.

Place brush far back on chewing surface of left lower molars and sweep back and forth to bicuspids. Same on right molars and bicuspids.

Wash brush and hang up to dry. Rinse mouth vigorously with tepid water. Use tooth-pick or dental floss between all teeth and behind last teeth. Rinse mouth again.

The dental toilet should be performed in this way before retiring and before breakfast. Immediately after eating the mouth should be vigorously rinsed and tooth-pick or floss used. If gums are soft or sore they should be vigorously massaged with the pad of the finger once or twice daily.

If a tooth should be knocked out accidentally, it should be washed and replaced immediately and a dentist consulted at once.

In case of illness the mouth should be kept as clean as possible both mechanically and by the use of lime water and other antiseptics. The tongue should also be frequently cleansed and scraped.

(*) What is the matter with this little fellow? Did you ever have toothache? Did you cry? If you will follow the instructions given in this lecture you need never have toothache again.

It is not what we learn that makes us wise and happy, it is what we remember and practice.

CHAPTER V.

POPULAR LECTURES—CONTINUED.

AN ILLUSTRATED LECTURE BY DR. T. P. HYATT.—LECTURE FOR SCHOOL CHILDREN BY DR. HUNT.

LECTURE ON ORAL HYGIENE.

BY DR. THADDEUS P. HYATT.

This subject is one that is attracting the attention of the whole civilized world. The medical profession and the dental profession are discovering to-day that the teeth are an intimate part of the whole body—that conditions of the mouth affect the welfare and the health of the whole body.

We are dependent upon three things for our life, and without any one of them the body dies, so you will realize that these three things must be very important. First, we need food; without food the body dies. Second, we need water; without water the body dies. Third, we need air; without air the body dies. When you remember that these three things essential to the life of the body pass through the nostrils and the mouth and are affected by the state of health of these, you will realize how important it is to consider the condition of the mouth and the air passages at the back of the mouth. It is necessary to have both good food and pure water, and they should go into the system without any contamination detrimental to that purity. The mouth is the portal of the life of the whole body.

I said the subject was attracting the attention of the whole civilized world. In August, 1913, a convention was held at Buffalo, N. Y., of the International School Hygiene As-

sociation. Governments from all parts of the world sent delegates to the convention. The President of the United States was the honorary president, and Dr. Eliot presided at the convention. The first open meeting of the convention was devoted to the subject of mouth hygiene, and it was my pleasure to speak at that meeting. When I tell you there were over 3,000 persons gathered there, and that this session was the most largely attended of all the meetings during that week, you will realize the importance of this subject.

The following are some pictures illustrating dentistry as performed in the past, and dentistry performed on animals:

Fig. 21. This picture illustrates dentistry in Persia about 800 years ago. The poor victim was laid on the ground. Two men were necessary to hold him down, and the dentist needed not only a pair of forceps, but an iron bar to help him pry out the tooth. Of course, in almost every instance the tooth was broken, and the patient's condition was worse than before.

Fig. 22. This hippopotamus had an abscessed tooth, and could not eat anything, and was in danger of dying. The only way to save that animal's life was to extract the tooth and stop the formation of more pus. The dentist extracted it. The abscess was cleaned out, and the life of that animal was saved. Think of little children with abscessed teeth, and consider the difference between the strength and the size of a child's tooth and that of a hippopotamus!

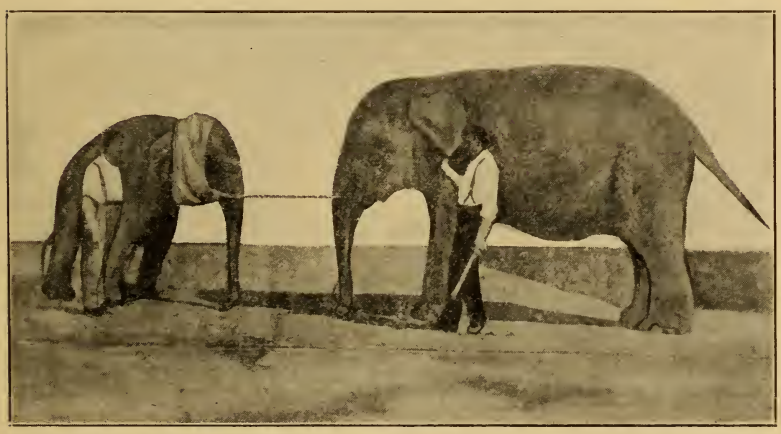


Fig. 23. This shows a very interesting affair at Luna Park, Coney Island. This elephant had an abscessed tooth, and no one was strong enough to extract it. A hole was drilled through the tooth, and a piece of piano wire passed through it. Then a rope was tied to the end of the wire, and tied to another elephant. Both elephants were given the signal to back, and out came the tooth. That is the first instance known of an elephant drawing a tooth.

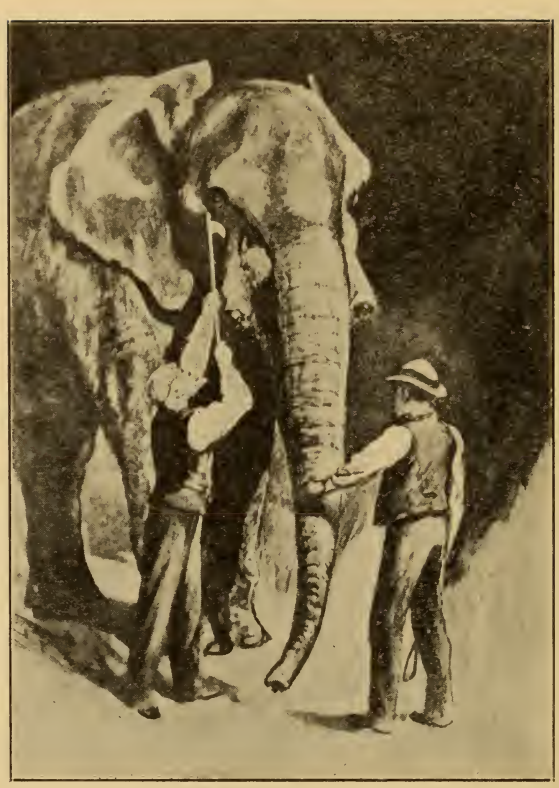


Fig. 24. This is a picture of Jumbo, who was exhibited with Barnum's circus, and before that in the Zoological Gardens in London. When I was a boy, in London, I had the pleasure of riding on Jumbo's back a great many times, for two cents a ride. Jumbo died in Bridgeport some years ago, and he died the death of a hero. He saved the life of Alice, his mate. She was standing on the railroad track, and the light from the engine of the train blinded her. She could not get out of the way. Jumbo charged the engine, and pushed Alice aside, but was himself killed. Jumbo broke both tusks when young and abscesses were formed. It became necessary to lance the abscesses because pus was being formed, and the life of the animal was in danger. The doctor took a hook-shaped lance and went into the stall of Jumbo. The doctor got the lance over the abscess and ripped it open. In about six months, there was another abscess. People make a great fuss if they know they are going to be hurt, and expected Jumbo would make a great fuss when they attempted to hurt him again. The doctor had his lance ready, and

the keeper was there to use persuasion and force. I do not know whether an elephant thinks, or not, but Jumbo must have realized that the lancing of the former abscess, which was so painful, restored him to health, because he came forward to the doctor, lowered his head, and turned the left side of his head, keeping perfectly still while the doctor opened up that abscess and washed it out and dressed it.

If an elephant can be as intelligent as that, and stand pain, I trust each one of you will think of Jumbo, and be as intelligent and brave as he was, if it should ever become necessary for you to have any dental operation done.

It would seem almost a preposterous statement to assert that the size of the brain depends upon the teeth; and yet we are learning to realize that this is absolutely true. A physician took six little baby rabbits. He kept one normal. On the other five, he mutilated some of the teeth. On some, all the teeth on one side were taken out. On the others, all the teeth on the other side were taken out. The rabbits were allowed to go out and play, and when they reached full size, they were killed, and their skulls examined. The rabbit that had all its teeth, had a perfectly normal and symmetrically developed skull. In the rabbit with its teeth cut out on the right side, the skull was not well developed on that side, although it was well developed on the left side. In the rabbit that had its teeth cut out on the left side, the skull had not grown as much nor as symmetrically on the left side as on the right side, where the teeth were normal.

The food is first bitten off by the incisors, then it is broken up by the bicuspid teeth, and later it is ground fine by the strongest and largest of the teeth, and mixed with saliva so it can be swallowed. The first step for digestion takes place in the mouth, and if this is not done properly, digestion can not be properly done. You can not swallow a piece of meat, or bread, or food of any kind, without chewing it, and expect it to be properly digested. It must be properly chewed and mixed with saliva before it is swallowed.

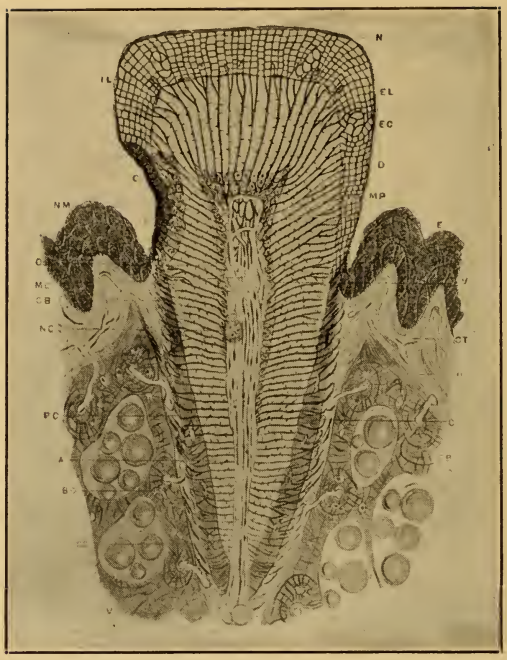


Fig. 25. The crown of the tooth is visible, and the root is not visible. Over the crown is a hard substance, known as enamel. It is the hardest substance in the whole body, and is pearly-like in appearance and lustre when clean. You read in the Bible of the teeth as being pearly. They are pearly in appearance when kept well-brushed and polished. Covering the root is a substance not quite so hard as the enamel, known as the cementum. Inside of this there is a substance known as the dentine. Within this is what is called the pulp. It is made of soft material and has an arterial supply, which gives fresh blood to the tooth. There should be a blue line here, to show the venous system, which carries away the blood which has become impure.

If I should say to you that there were eight men taken from an insane asylum to a dentist because their teeth needed attention, and that six of them did not need to go back again, because they became sane after their teeth had been treated, you might think I was making a very exaggerated statement. Yet that is true. Six of eight men did not need to go back, because they became sane.

If I should tell you a blind person was taken to a dentist, and when the mouth was put in proper condition, the sight returned, you would wonder what the teeth have to do with the sight.

If I should tell you a woman was paralyzed on one side of her body, and when her mouth was put in good condition, and some old roots taken out, the paralysis disappeared, you might marvel, and wonder what that had to do with the teeth, but I will show you.

Do not think every blind person, or every paralyzed person, or every insane person could go to the dentist, have his or her teeth attended to, and then have health restored, or sight returned, or become sane. It happened that the trouble in the cases I spoke of was of dental origin.

Your teeth are more valuable to you than your pocket-book. If you go to a dentist and have confidence enough in him to let him attempt to save your teeth, you should not think of the price he will charge. You should not be afraid to put down your pocket-book and tell him to help himself to its contents. He may take all you have in money, but you can go out and earn more money, but you can not replace lost teeth. They are much more valuable to you than your money. If you have confidence in your dentist, you will go to him and ask him to examine your mouth, and he will tell you, "Here is a small cavity, and if a filling is put in now it will last much longer, and protect your tooth much better than if you allow it to go on and get larger."

I had the pleasure of being at a dental meeting and hearing Dr. Van Cott, one of the most prominent physicians of this city, tell of a case of a prominent physician who died recently from a case of infection from an abscessed tooth; the pus had been carried back to the heart, and a heart lesion had occurred, and the physician died from this cause. I could not have given you, ten or fifteen years ago, this great

knowledge of the relation of mouth conditions with heart troubles.

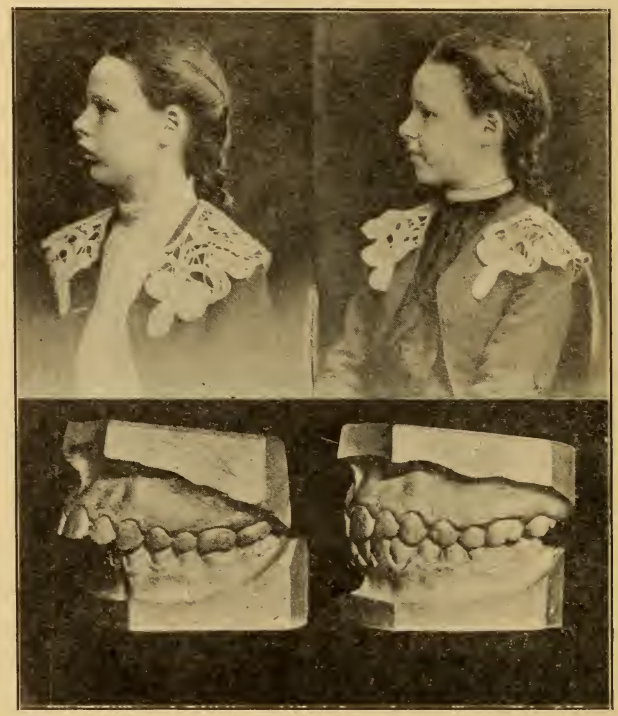


Fig. 26. This illustrates a little girl, whose upper teeth projected; the teeth did not come together properly, and she was what is known as a mouth breather. Her blood became anaemic. She had enlarged tonsils and adenoids, and her health became impaired. She did not care about play, or study, or work, or friends. She was taken to a dentist, who regulated those teeth so each one would be in its proper place, with the result that soon this child was able to keep her mouth closed at night. Her appetite became better and her health better; she wanted to play, and she wanted friends, and she became one of the brightest students in the class. The health and the mentality of that child depended on the condition of her mouth.

Fig. 27. Here is a young girl whose lower teeth shot out too far. Look at her face—the cheeks sunken, her chest is sunken and narrow, and she does not look happy. Her mouth was attended to, and see the difference in this picture. Look at the good development of her chest. Not only was the natural beauty of that child brought forth, but health was brought to her, and see how the child responded to the physical development!

Dr. Woods Hutchinson recently said a man in days gone by used to fight for his life with his teeth, and to-day we find his life depends upon his teeth. Then he said, "A man is known by the teeth he keeps."

I had not realized it until I heard Dr. Hutchinson say that, and then I had a slide made to use in my lectures, with those words on it. You may not have formulated your feeling into words, but you can not look into the face of any human being when the lips are parted, and see decayed and rotten teeth, without having a feeling of repugnance towards that person. You will after to-night formulate your feeling, if you have any thought on the subject. If you see men or women with good, clean teeth, you will feel they are clean, healthy people.

Fig. 28. Here is a young woman with her teeth decayed in front. Of what use is it for her to put a pink bow on her hair, or powder on the tip of her nose? You feel as though she were not clean. There is a feeling of repugnance when she opens her lips and smiles. But see when she has her mouth attended to, and the teeth cleaned! There is a feeling of wholesomeness about her, and she does not need the pink bow, or the powder on her nose to make her attractive.

It was my good fortune to go to Bridgeport not long ago and see the tooth brush drill there. You would be surprised to see how eager and happy the children are to learn it. The children are instructed to take their tooth brushes home, and how to use them, and they take such an interest in them, and consider them of so much importance, that recently, in one of the homes, it was found that the child's tooth brush was kept on the parlor mantel-piece!

It is significant to find, too, that a little burglar broke into the dental assistant's office, where the supplies were kept, and stole twenty tooth brushes, and gave them to his little friends. When children will begin to burglarize to get tooth brushes for themselves and their friends, it looks as though the importance of having clean teeth was beginning to be appreciated.

Fig. 29. Here is a picture showing that McGraw, who has charge of one of the great baseball teams has learned that as a business proposition, it was not only advisable but exceedingly desirable to have a dentist take charge of the teeth of the players. They could not play well if they were suffering from their teeth.

The Japanese army, in their war with Russia, had wagon-loads of tooth brushes and tooth powder with them, so that the Japanese soldiers could keep their teeth clean, and their mouths in good condition, knowing the effect that bad teeth would have on their general health.

The manager of a large St. Louis concern sent one of his best salesmen out to get an order of $50,000, and he realized that the order was lost because the salesman when arriving at his destination had an abscessed tooth, which was so painful that he was not able to do any business. He had to go to the dentist and get relief, and he was so weakened and distressed that he could not attend to his business, and someone else got the order.

That manager said: "No salesman will go out from here any more unless his teeth are in good condition."

The government is spending large amounts of money that your food supply shall be pure; but what about the mouths into which this pure food and this pure water go?

Many persons have made the remark: "If you are going to teach people to keep their teeth clean, and not let them decay, you will deprive the dentist of work." It is very difficult to keep teeth perfectly clean; but there is not a dentist in this city who would not prefer to work in a clean mouth, knowing that his work will be appreciated if a person realizes the importance of the cleanliness of the mouth.

There is nothing I feel quite so badly about, as after having done a nice piece of work—and there is pleasure in doing nice work—to find that the person is so careless as to allow the mouth to become filthy, so that decay takes place, and my work will be destroyed. It does not satisfy me to know that I have completed the work; I would like to know that the work is being kept clean, and that it will last.

Supposing, for example, a law were passed that every man, woman and child in New York City should have their teeth taken care of, and their mouths put in perfect condition. Suppose every dentist in the United States, in all the large cities, and in all the villages and country towns, were brought to New York City; then suppose we compelled these men to work ten hours a day—Sundays as well, and holidays—they would work 365 days a year, ten hours a day. How soon could they fill all the cavities in the teeth of the people of New York, and put their mouths in good condition? It would be three, four or five years before we could do the work that is necessary, in New York City alone to-day; and think of the new cavities being created in those three, four or five years. This task is beyond the power of man.

The only way to cope with the people, is to come before the people and try to explain to them the importance of their

mouth and teeth, and the intimate relation between the mouth and teeth and the different parts of the body, and get the people aroused to the point that they are willing to keep their mouths as clean as possible, and teach the children in the schools, so they can have the tooth brush drill and all the things that help to keep the teeth clean.

In Boston, at St. Vincent's orphan asylum, where 300 to 400 children are kept, they engaged a dentist. In that institution they used to have an average of 108 cases of children's diseases during the year. Dr. Keyes and several assistants came there and instructed the children in the tooth brush drill, examined the children's mouths, extracted those teeth that could not be saved, filled the others so they could be used for mastication.

At the end of the first year, they had only sixty cases of sickness; at the end of the second year, none; at the end of the third year, none; and at the end of the fourth year, four cases of measles that were brought in by a new child.

The prevention of sickness in this orphan asylum that I mentioned, came from the fact that the children kept their teeth and mouths clean, and prevented infection from getting into their bodies.

I sometimes ask a patient, "Do you rinse your mouth?" They say, "Oh, yes." I say, "Rinse your mouth." They take a mouth full of water—so full that they can not move it around, and then spit it out. That is of no use at all. I sometimes tell my young patients to spit between their teeth, and keep the lips together. Then you force the liquid between the teeth, carrying the food with it.

I am sometimes asked, "How often shall I clean my teeth." One lady asked me this recently. I looked at her, and felt sure she cooked her own food, so I asked her how often she cleaned her pots and pans and cooking utensils. "Why," said she, "as often as I use them." Then I said, "That is how often you should clean your teeth."

Microbes find their most speedy development in the mouth. There is no apparatus made for the development of microbes when we want to study them that is as good an incubator as the human mouth. I heard a physician—not a dentist—advocate the cleansing of the mouth before meals as well as after meals. That is asking a great deal, but do it as often as you can. If you can only do it once a day, do it at night.

To my audience of children I often put this question: "How many children go to bed with their shoes on?" No hands are held up. I tell them they would not be doing as much harm to themselves if they kept on their shoes, as they will if they go to bed with food on their teeth. I ask them to promise not to take off their shoes until their teeth are cleaned.

Broken down bone tissue is more poisonous and irritating to the mucous membrane of the digestive apparatus than the discharge of an ulcer on the arm. You would not put your lips to an ulcer and swallow the poison from it; yet you are swallowing the poison from your broken down teeth all the time. If you would realize that you would go to your dentist in a better frame of mind, and you would co-operate with him.

If I have made this lecture interesting, and have been able to impress its importance upon you, I hope you will tell your friends about it. I hope you will tell them to watch the little child who has its sixth year molar coming into the mouth; and if you impress the importance of this upon them, so that they will take care of their teeth, I shall be repaid for my lecture.

LECTURE FOR SCHOOL CHILDREN WRITTEN ESPECIALLY FOR THIS BOOK BY THE LATE DR. GEORGE EDWIN HUNT.

Now, young ladies and gentlemen, I am here to-day to give you a talk about the mouth and teeth, and since it is easier to ask questions than to answer them, I am going to begin by asking you a question or two. The reason why your teachers ask you so many questions is because it is easier to ask them than to answer them. The first question I am going to ask is, "How many of you washed your faces before you came to school this morning? Hands up." Well, that's good. I guess everybody washed their faces before they came to school this morning. There's one boy over there in the corner that only put his hand up part way, but I guess he must have washed for a high-necked collar. Now, I'm going to ask another question, "How many of you cleaned your mouths before you came to school this morning?" Ah! that's not quite so good. Quite a number of you did, but there's quite a number of you that did not. Now, in my opinion, if you are going to make a choice between these two things, I think you should clean your mouths and not wash your faces, but if I were you I would do both, because if you don't wash your faces you won't look very pretty, and if you don't clean your mouths, a lot of other things are going to happen to you that I'll tell you about.

Now for another question: "How many of you ever had toothache?" My goodness! Nearly every one of you has had the toothache. And those of you that haven't had toothache certainly have seen people having toothache and know what it is like. Suppose I tell you what makes your teeth ache. In order to do it, I am going to ask you another question. I am a great fellow for asking questions. "Suppose the evening meal was over and everybody had left the dining-room but mother, and mother is clearing up the table. She finds some nice boiled potatoes, and

here is a nice piece of meat too large to be thrown away, and here are some other vegetables that she can keep until to-morrow. Maybe she will chop up that meat and put potatoes with it and have hash for breakfast. When mother makes hash it is a pretty good thing to eat. Now, where does mother put that food to keep it until to-morrow, so that it will be nice and fresh?" (A pupil—"In the ice box.") Yes, she puts it in the ice box. But why does she put it in the ice box? Why not just put it out on the back steps where the sun will shine on it and the rain will fall on it? Now, we won't say anything about the dog or the cat getting it or the birds carrying it away, but just tell me what happens to food if she were to do that? (A pupil—"It would rot or decay.") That's it. It would rot or decay. Well, that's just exactly what happens to food in your mouth. That isn't very pleasant to think about, is it? Every time you eat, you leave some particles of the food, no matter what kind of food it is, about the necks of the teeth and in between the teeth, and if it isn't removed that food rots or decays just as the food from the dinner table would do if mother put it out in the sun and rain. Now, when that food rots in the mouth there are certain acids formed, so you are carrying around a sort of acid factory in your mouth and nobody wants to feel that they are an acid factory. This acid dissolves the tooth just as water will dissolve sugar when you pour the sugar in the water and stir it up, although it does not dissolve it nearly so fast. But it dissolves it just a little at a time and the first thing you know that tooth has a cavity in it. A little later on that cavity gets deeper and pretty soon the tooth begins to ache. And that's the way you have decayed teeth and have toothache. Don't you think it would be better not to leave those particles of food around the teeth so that they will form acid and give you toothache?

There are three reasons why I think you ought to take care of your teeth. The first reason is that you will not

have pain. The second reason is that your health may be better. The third reason is that you may be more beautiful. Now, when I talk about being more beautiful, these boys laugh in their sleeves because they think they don't care whether they are beautiful or not, but we girls know that in a few years from now we will wish we were good looking, don't we?

Now, in regard to the first of these three reasons. You have told me that nearly all of you have had toothache and that those who have not had toothache have seen people who were having toothache, so that I don't think it is necessary to spend any time in telling you that toothache is not a good thing to have. Nobody would go around hunting for a toothache. So we will just take it for granted that you know that you don't want a toothache and think that your teeth should be cared for on that account.

Now for the question of health. You have all heard of a certain part of the body which has an awfully long name, and which it is difficult for me to remember, but I can sometimes recall it—the alimentary canal. It is in this alimentary canal where all digestion of food takes place, and if it wasn't for the alimentary canal, we would all starve to death. I don't know whether you know it or not, but the alimentary canal in grown-ups is over thirty feet long. That would make a person awfully tall if the alimentary canal was straight, but it isn't straight. Now, here's the point I want to make. In that whole thirty odd feet of the alimentary canal there are only three inches—these three inches from the teeth to the back of the mouth—over which you have control of your food. Now, since digestion starts here in the mouth and digestion can not start properly unless this food is well chewed, and since you have no control over the food after you swallow it, don't you think it's a good plan to take care of it while you have a chance to do so?

Now I'm going to tell you how to eat. I expect you think you know how to eat but I don't believe you do, and I'm

going to ask you to do something for me. When you go to the supper table this evening, I want you to take a bite of bread and butter out of the middle of the slice. Don't get any of the crust, but just get the soft inside of the slice. Then see how long you can chew that. Now you probably think you can chew it just as long as you please but you can't. After a while, and it won't be very long either, you will find that there is nothing in your mouth. You have swallowed that bread and butter and didn't know when you did it. That's the way you ought to chew most foods. You can chew potatoes that way and most cooked vegetables, but not all of them. Then there are some foods you can't chew that way at all, so they will swallow themselves. Unless you get better beefsteak here than we do where I live, you can't chew beefsteak that way, and unless you get better celery here than I do, you can't chew celery that way, because it is stringy, and you can't always chew string beans that way unless they are very well unstrung. However, those foods that you can't chew until they swallow themselves, should be chewed until there is no longer any taste to them. Then you can swallow them all right. Now if you would chew your foods that way, it would be a great thing for your teeth and gums, and I am sure you would enjoy it more if you would once get in the habit of eating in that manner and your health would be very much better.

Now, girls, I am going to talk to the boys a few minutes and you can listen if you want to. How many of you boys ever heard of a game called baseball? Well, I guess most of you know all about baseball. Well, if you boys want to be good baseball players, or good football players, or good tennis players, or good in any other line of athletics, you have to have good teeth, and you have to use them properly. Now maybe you think that is a funny thing for me to say. But don't you see, that since digestion starts in the mouth, that if you don't have good teeth to chew your food with and don't use your teeth properly you won't have good di-

gestion. Nobody with poor digestion can ever be a good athlete. Did any of you boys ever hear of Connie Mack, or John McGraw? Why of course you have. Connie Mack is manager of the Philadelphia Athletics, the champion baseball team of the world, and John McGraw is manager of the New York Giants, which is the second best team in the world. Well, when the Athletics and Giants report early in the spring for spring practice and to go to the training ground, Connie Mack and John McGraw make them go to the dentist and have their mouths put in order before they can ever begin training. Now, Connie Mack and Johnnie McGraw don't care whether those ball players of theirs are pretty or not, nor they don't care particularly whether those ball players have pain or not, but they do know that if the ball players mouths are not in good condition that they can't play ball as well as they could if their mouths were in good condition. Suppose there was a World Series on and the Athletics had won three games and the Giants had won three games and the next game was to decide the world's championship. And suppose the next morning Baker, of the Athletics, their best batter, were to show up at the ball ground with his face swollen out with an abscessed tooth. He couldn't play baseball that day. Even if he tried he couldn't play well. And his absence from the team might cause the Athletics to lose the world's championship. So you see that to athletes, bad teeth are a great handicap. Connie Mack knows that and that's why he insists that Baker's teeth shall be in good condition and that he shall keep them in good condition all through the playing season. He knows that Baker wouldn't play as good baseball if he had a mouth full of bad teeth.

And now you girls. You like your roller skates, and you like to play tennis, and you like to dance, and you like to do a lot of other things that depend a great deal upon the condition of your health. Then you don't want to have indi-

gestion and headaches and all those kind of troubles when you are growing up because they interfere with your school work just as they interfere with the boys' school work also. And unless your teeth are in good shape and you use your mouth properly, you will not be in good health. Nobody in school can do their best work and keep up with their studies if they are suffering with toothache, or if they are suffering from indigestion, because of the condition of their mouths. You don't want to fall behind in your classes and have to take a part of the work over again, and yet you can't keep up with your classes unless your health is good and your health can't be good unless your mouth is in good condition. So you see your health depends a good deal upon the condition of your mouth.

Now to take up the third reason why you should care for your mouths. You boys may not think now that it makes any difference whether your mouths look good or not, but it does. Pretty soon now, you boys will have to get out in the world and earn your own living. Your fathers and mothers have been pretty good to you so far, but they can't take care of you always, and after a while you have to earn money for yourselves. Then again, later on, perhaps, you will have to be earning money to take care of one of these girls, also. Now, suppose a wholesale merchant in this town wanted a boy to come into his establishment and start way down at the foot of the ladder, with a prospect of working up. It may be the boy could get to be a general manager of the institution after a number of years, or head book-keeper or some good paying job. Suppose two boys apply for this job. One of them has a mouth full of dirty teeth, with green scum on them, cavities showing in the front teeth, mouth foul as can be, breath bad on account of his decayed teeth, perhaps one or two teeth gone. The other boy has a mouth that shows that he has taken care of his teeth, that he cleans his mouth, and takes some pride in it. Which one of

those two boys will the merchant hire, other things being equal? He'll hire the boy with the clean mouth. He will say to himself, "This boy with the clean mouth takes some pride in his appearance and is more likely to take pride in his work. This boy with the dirty mouth is very likely to be slovenly about his work." And then again, the merchant would argue to himself, the boy with the bad mouth is more likely to lose time and neglect his work on account of toothache than the boy with the good mouth. So you see that it does pay you to have good looking mouths, even in business, and it pays you girls, too. Of course, you are more likely to have pride in your looks than the boys are, but from a purely business standpoint you ought to take care of your teeth. If you grow up and have to earn your own livings or want to make a little extra money working in an office or store, you will find that you can get work a good deal quicker if you have nice looking mouths and nice looking teeth, than you can without them. Merchants don't like to hire a girl in their store to sell goods to customers if her mouth is in such shape that her breath is bad and her appearance is bad. Everybody ought to be as handsome as they can in this world, because other people have to look at them and they ought to make it as easy for the other people to look at them as they can. So those are the three reasons why I think you ought to take care of your mouth and teeth, and now having told you all of this about what will happen to you if you don't take care of them, I think I ought to tell you how to take care of them.

But, first let me tell you how often you ought to clean your mouth. Of course, if you could do it, it would be better for you to clean your mouths every time you eat anything, but that isn't always possible. I think, if I were you, I would rinse my mouth out with water the first thing when I get up in the morning. Then after breakfast, I would use my toothbrush and the floss silk in the way that I will describe to

you, and then if you don't clean them again until just before you go to bed, you will have done pretty well, anyhow. Always give your mouth a good cleaning just before going to bed. Don't forget that, because it is very important.

(Now the lecturer should give a talk on the toilet of the mouth. If stereopticon views could be shown, they can be begun at any point in the talk that the lecturer desires. Personally, I begin showing my stereopticon views as soon as I have wound up my argument for good teeth. That is, just before this talk starts in on telling them how to take care of their mouths.)

CHAPTER VI.

DENTAL EXAMINATION AND CLINIC FOR PUBLIC SCHOOLS.

HISTORY.—SCHOOL INSPECTION.—HOW TO START SCHOOL INSPECTION.—REASONS FOR FREE DENTAL CLINIC AND SCHOOL INSPECTION.—IMPORTANCE OF DENTAL INSPECTION, BY DR. ZARBAUGH

HISTORY.

It is of interest to note that in 1879 Russia started this inspection. Chicago, some thirty years ago, was the first city in the United States to have this work. Ann Arbor, Mich., was one of the first cities to make this inspection under the supervision of the school board. Cambridge, in 1907, had the first school dental clinic operated in this country. Nearly all the foreign countries have made great strides in this direction, and America has, at last, awakened to the need of this work. Nearly every state in the Union is now doing some work along this line.

SCHOOL INSPECTION.

The object of education in its broadest sense is to make of the children efficient citizens. This is proving a very costly proposition in regard to taxes. The erection of new buildings and the increasing of teachers' salaries are not the only reasons for this cost. Probably, one of the most important problems is the thousands of dollars expended each year for the education of children who will never reach the age of citizenship. Now, the main point is that most of these deaths are from preventable diseases, and the further point

is, that most of these preventable deaths could be prevented by proper dental attention. The proof of this case can easily be established by the study of the statistics of any well directed dental clinic. Here is the only investment where the Board of Education can realize 100 per cent. for every dollar spent.

The State recognizes that education is the best thing to give a child in order that the future citizens may be more efficient. Thus, free education is offered, but we have found that many defects in these children, such as bad teeth, will not only prevent them from taking full advantage of this state service, but that the future citizen is injured for life. When the state begins to realize that most of these defects can be easily corrected or entirely prevented, then, the universal adoption of inspection and the dental clinic will be a fact,—necessary as a school desk.

One of the speakers at the dedication of the Forsyth Dental Infirmary was Dr. Donald M. Gallie, President of the National Dental Association for 1915. In his address he said:

"It was not until epidemics broke out in schools throughout the country and the carrier of contagion was traced to the mouth, teeth and tonsils, that the people and our medical teachers realized the importance of our campaign. In addition, a scientific and practical test was made in the Marion School of Cleveland, which demonstrated conclusively that the mental, moral and physical condition of school children was greatly improved by dental inspection, instruction and care.

"In 1911, when preparing the annual message for the Illinois State Dental Society, I wrote to the President of the School Board and the Commissioner of Health of every city in the United States and Canada of over 35,000, of which there are about 130, asking them the following questions:

"1. Are the children of the public and parochial schools of your city instructed in the care of the teeth and surrounding tissues?

"2. Are the teeth of these children examined by a dentist?

"3. Have you any free dental clinic in your city where the teeth of the poor are cared for?

"I received sixty-five answers.

"To question 1—No, 40; yes, 25.

"To question 2—No, 52; yes, 13.

"To question 3—No, 42; yes, 23.

"In answer to question 3, the twenty-three answering yes were practically all from cities having dental colleges. To-day, but three years later, if we were to send out this inquiry we would find that not only in practically all the large cities, but also in scores of the much smaller cities or towns they have inaugurated dental inspection, class instruction, and in many cases some means of caring for the unfortunate. In many of the large cities provision has been made for from five to fifteen clinics, and appropriations for this purpose run as high as $20,000 yearly. Surely this is making progress, and gratifying as it is, yet how inadequate when we consider the tremendous demand and need!"

The State of New York was the first to establish and give official recognition to Oral Hygiene in connection with the Department of Health. This Oral Hygiene department was inaugurated February 1913. Cities and towns are visited by official lecturers who are furnished with the most efficient charts and lantern slides.

Dr. W. A. White was one of the first to give lectures for this department of the work. He writes:

"The failures in final examinations in our schools show that 50 per cent. is due to trouble with the mouth and teeth. These delinquents, classified as repeaters, have awakened the Boards of Education and brought to their attention an

important duty to such an extent, that a thorough investigation of the cause of this large percentage of failures, has been carried on, which proved to be "decayed teeth," and the result has been that free dental dispensaries, in connection with the schools, have been established in all sections of the state, and nearly every school building now under instruction will be provided with a complete dental equipment, for the benefit of the poor boys and girls attending these respective schools, who may need dental attention, which will have a tendency to obliterate much of this long neglected condition, and will, as has been satisfactorily demonstrated, be the logical medium for moral, mental and physical improvement as well as normal development, and will demonstrate to the world that scientific research work has done no greater work than to acquaint mankind with the relation that the mouth and teeth bear to the human body and health which very clearly show us that every phase of the dental art is a dominating factor in dealing with the health problem in all of life's characteristics."

Dental examination in public schools consists of inspecting and tabulating the oral conditions of the students by some dentist under authority of the local dental society or public school authority.

The object to be gained by the inspection of the teeth of school children is:

First, to show the people and the parents the actual existing conditions. To tell, for instance, that in New York examinations show such and such defects, is not as interesting as to show them the conditions in their own children's mouths.

Second, to increase the working capacity of the child.

Third, to accumulate data which will in the future force the people to wake up on this subject.

Fourth, to show, by comparison with schools that have established this system, what can be done.

All statistics of school examinations show that dental lesions are in the majority of all defects, ranging from 80 to 98 per cent.

One of the objections that will arise in the minds of the school board, whether expressed or not, will be that they invariably think that the dentists have some ulterior motive, or that they are ambitious to advance themselves. This, of course, can be met with the fact that the dentist, in many instances, is doing the work free of charge, and, in addition, is furnishing material, charts, and stationery at his own expense. Medical examiners are generally paid a salary or else a fee for some special examinations.

HOW TO START DENTAL SCHOOL INSPECTION.

As nearly all schools have some sort of medical examination or supervision, the beginning of dental attention must, of necessity, be done through the medical examiner. It is a good start for the dentist of local society to secure the medical examiner's sympathy and co-operation. Have him visit some dental office and show him by pictures and by examination of a patient what to look for and how to find defects in children's mouths. Mail him reprints from the dental journals on the subject.

In attempting to start dental inspection or clinics in a new place, the dentist often finds a lack of interest or even opposition on the part of the commissioners of education and the teachers. This is humiliating. On the other hand, we have found that physicians do not have to beg the schools to accept their services, but are welcomed, and the necessary funds are forthcoming for their enterprise. It is even necessary sometimes for dentists to beg to put in dental inspection in one school just to show these men from "Missouri" what can be done. This is the one place where it is better to work first with the medical examiner. Go to him, teach him how to examine for dental defects, and then get

him to state in his reports the dental defects which he has found. This will do the authorities more good than forty dentists going before them. After the medical examiner has done this, you have the entering wedge.

When the medical examiner has made his report, the next man to see is the superintendent of the schools. Put the facts up to him as given in our chapter on Oral Hygiene. Explain to him that it is not placing a burden on his pupils, but taking a burden off of them. If you can win his co-operation, one-half of the battle is won. Taking him along with you to see the president of the board of education, and at a special meeting have a committee along with reliable facts on oral sepsis, and show literature and statistics from other schools which have inaugurated this system. Show them how pupils with dental irritation are unfit for study. Offer to make a voluntary inspection of one school at the opening of the term and at the close of the term. Have prepared blanks somewhat on the order of those shown in this book, and then the next year when it goes before the board of education, meet them on a plain business basis. After you have secured consent for the first examination, see that the parents are acquainted with the conditions of the children's mouths, and that the child is interested through popular lectures in prophylaxis, tooth brushes, and dentifrice. It is also well to have some slides with pointed paragraphs on them or printed cards. Stop in the lecture and write these points on the black-board every few minutes. A break in a lecture like this has a good impression. Statements like the following should be used:

"A Clean Mouth Prevents Pain and Illness."

"Food Left Between Teeth Causes Decay."

"Dirty Mouths Breed Disease Germs."

"A Clean Tooth Never Decays."

"Clean Your Teeth After Eating."

Sometimes it is necessary to use some other attractive schemes to produce results. In Wilksburg, Pa., the dental society devised a plan by which the children were induced to use the tooth brush and dentifrice furnished by the society. With each package, a check was given to the children. Five of these checks would secure a package free. The checks were given out by the teachers for keeping the teeth clean and owning a tooth brush. The reports from the use of such schemes seem to indicate that they are proving their worth; the statistics collected by the dental examiners have been highly satisfactory, and the parents of the children have shown a keen interest in the work.

Out in Oklahoma they use some original ideas in regard to teaching oral hygiene and have made quite a success. Dr. L. G. Mitchell describes this method and system as follows:

"At the invitation of our State Board of Health we prepared an oral hygiene exhibit that was sufficiently complete to furnish subject matter for a complete lecture. This exhibit has been taken to a number of towns and cities in the state where suitable lectures were given by local dentists. This was brought to the State fair, where lectures were given each afternoon by local men, suitable literature being given to those interested.

"At our 'Better Babies Contest' during the fair, it was noticed that there were fewer discolored teeth than a year ago.

"Our State University, taking cognizance of the importance of the work, has purchased a stereopticon lantern for our use.

"There seems to be a widespread opinion that the examination of the mouths of school children, sending to the parents a chart showing what work is needed, is a very important initial step in this work. While I agree that this is important and productive of much good, still I am convinced

that the same amount of time and energy could be better expended in delivering suitable lectures to the school children. Simply the examination of the mouth, telling the children that needed work should be done, the children in turn repeating this to the parents, and showing the chart, does not bring the definite and actual results as do the lectures.

"It is not difficult to impress the children with the WHY in lectures, and when this is done you are going to get quicker action. The children will carry the message home just the same as though their teeth had been examined and they will begin using the tooth brush, which is the principal thing we are after.

"While the correction of faulty conditions is important, it is of greater importance that we emphasize prevention, so if it is not feasible to construct an elaborate machine for making these examinations, carefully charting the results and conducting the lectures too, I believe it is best to confine the work to the lectures.

"Again, to go into a school and make examinations disturbs the class work. This is also true in delivering lectures. All this means a heavy draft on the patience and forbearance, or let us say patriotism, of the teachers and school board.

"In our lecture work here we adopted this plan: We arranged with the principal to lecture at an hour that best suited the convenience of the teachers. They put two and sometimes three rooms together. In introducing the speaker his name would be omitted, thus giving the speaker an opportunity to disarm the children and the parents of the very prevalent belief that we were doing this simply to increase our business. The same plan is being followed when addressing school patrons' clubs.

"The State School Board issues a book which is an outline of all subjects to be taught and the manner in which they shall be taught. This is called the 'Course of Study'

book. This is the official guide for all teachers of the State, except in cities of the first class. The State Superintendent permitted us to prepare several pages of instructions to teachers for this book. The same matter was published in pamphlet form to be placed in the hands of the teachers in cities of the first class, so that every teacher in the State has this matter as part of their official instructions. (Any one desiring a copy of this will receive one upon application.)"

A simple and efficient method of teaching children the importance of oral hygiene was carried through to a successful issue by the Superintendent of the Watouga, Okla., City Schools. First, the teachers received several lectures on the subject from a competent dentist. Superintendent Gaddy, in writing of his method, says:

"I called a formal meeting of the school board, the druggists, the physicians and the dentists to which meeting I briefly but fully outlined a plan which they considered feasible and which was unanimously adopted. The plan submitted called for the following which all agreed to. The druggists to furnish a tooth brush and tube of paste for twenty-five cents, provided the same were to be used in the 'tooth brush drill.' The dentists agreed to treat the teeth of any child free of charge provided their parents were financially unable to pay for same. The physicians agreed to treat all throat troubles in the same manner.

"The school carpenter was instructed to construct a covered box for each room, each box having sixty holes in the lid the name of each child being placed immediately under the holes. Every morning the children would file past this box to take their brush and with their individual cups file out into the yard, their teachers standing before them with a brush and cup of water superintending and leading the 'tooth brush drill.' The children then file back, replace their brushes in the box in their proper places, handles first.

They are then allowed to dry in the sun. These boxes are then placed in a large cabinet made expressly for them. The cabinet is tightly closed and brushes fumigated with a disinfectant which kills all germ life which has escaped the sunlight. The large cabinet is 62in. by 20in. x 33in. deep, and holds 12 class room boxes.

"It is too early at this time to note any decisive good in the case of diphtheria which broke out in one room. Not one of the pupils who were exposed contracted the disease and contrary to custom we did not dismiss a single room but held closely and vigorously to the 'tooth brush drill.'

"The Watonga school system is not over supplied with teachers, yet not one of the corps has complained of over work on account of this oral hygiene work. On the contrary every one grows daily more anxious and enthusiastic about the good it is working for the children. None of the regular branches are in any way neglected, yet I dare say that it is of vastly more importance than some of the branches now incorporated in our school system."

Before the beginning of the school inspection, it is well to have printed the proper charts, the best of which are shown in this book in the following pages. Several adjustable head rests attached to common chairs, can be used for the examination. The examination should be made in a room separate from the class room, and three or four students called out togther. It is well to have a trained nurse to attend to the sterilization of the instruments. The assistance of several young dentists, who will generally be glad to give their services, should be arranged. The cards should be given to the children before they reach the examining room, with name and grade filled in. Since we do not have to include in our report all the minor defects which are found, the examination of about fifty children an hour can be counted on as an average. Specific information should not be given on the card which is sent to the child's parents,

as the reputation of the family dentist must be protected for the good of all. The only object of the examination being to let the parents know that they should have either their family dentist, or the school clinician to make further or more extensive examination of the teeth.

After the examination is complete, the popular lectures should be begun and the children and their parents invited. At these lectures the statistics of the examination should be shown, and means of improvement emphasized. All the while the first point in this movement is to remove the child's apathy towards the dentist, and to urge the necessity for oral hygiene measures. Get the child so interested that he will insist on the repair of the defects.

In all Oral Hygiene we must bear in mind the physiological laws by which the mouth and teeth are governed. It is of no use to lecture on clinics and things of this nature unless the child or the parent knows something about the diseases of the teeth and how to prevent them. This must first be understood in order that you may suggest to them the proper remedy for the cure. Thus, the mere filling of teeth at a dental clinic does not always accomplish good results unless we teach the child in simple language the dangers of destruction of the teeth and how such diseases can be prevented. In other words, it is the duty of those interested in this work to prove that healthy mouths are necessary for healthy bodies, and that healthy mouths may be accomplished by the means above described. We, as dentists, are apt to forget how little people know about teeth and how to care for them.

The dental colleges should be specially instructed to help in this work. In those places where there is no dental college, and where there is not time to establish a dental clinic, the practitioners must give certain hours to this free work for those who can not pay for it, for, the failure to repair

these defects found in the teeth of the children, would result in upsetting all the plans for prophylaxis work in the future.

REASONS FOR FREE DENTAL CLINIC AND SCHOOL INSPECTION.

It saves money for the county and state, for much of the expense of teaching goes to laggards, and a large per cent. of the laggards are made so by some physical defect. The largest number of physical defects lies in the teeth. This corrected, the laggards become normal in their class rooms. By putting the laggards through school each year, the school is saved the expense of having to teach the pupils two years

FIG. 30. A ROCHESTER SCHOOL BOY PATIENT OF THE FREE DENTAL DISPENSARIES.

"Handicapped in his school work, health, appearance and ability to secure or hold a position. It is necessary for him to leave school to help support the family. Who wants to employ a boy with a mouth such as this? We remove the handicaps and enable this lad to start even with his associates. This charity does not pauperize the recipient."

the same subject. It has been said that schools expend about twenty per cent. of their income on this kind of double teaching. Another of the greatest drawbacks to successful teaching is from absentees. A large per cent. of absences from school is from toothache. This remedied, the pupil is more apt to be regular in attendance, and consequently, can better concentrate his mind on his studies. (Fig. 30.)

Dental inspection in our public schools not only educates the children along these lines, but it also enables us to teach the parents what they can and should do for the younger generation in the way of preventing disease. The laity, being so ignorant on the subject of oral sepsis, should be given every opportunity, and should have impressed on their minds the close relation between these conditions and the general health. I have requested the privilege of publishing a personal letter from Dr. Zarbaugh. It contains the best argument for our work in the public schools:

TOLEDO, OHIO.

DR. ROBIN ADAIR,

Atlanta, Ga.

MY DEAR BROTHER ADAIR: Enclosed please find my effort on behalf of the school children of America. I could not speak the volume that is in my heart on this subject, because ours is an empty home, made so by the neglect of someone in allowing a child to return to school who had been ill with scarlet fever, without thoroughly cleaning the mouth.

I have looked into the diseases of childhood pretty thoroughly, and I find that absolutely *nothing* has been offered the medical men in the way of treatment but serumtherapy, and no progress has been made in preventing them, except what we of the Dental profession are able to do in the oral hygiene movement. I believe that it is our greatest field in which to work for humanity.

Ours was a bright, fair, blue-eyed boy nine years old, sick one week, bid us goodby after telling us that he was going to heaven, kissed us with a smile on his lips and passed on.

The same tragedy is being enacted in many homes at this very moment, and the sad thing about it is, that it could have been *and can be prevented.*

Yours very truly,

LYMAN L. ZARBAUGH.

IMPORTANCE OF DENTAL INSPECTION OF SCHOOL CHILDREN'S TEETH.

BY DR. LYMAN L. ZARBAUGH.

If the annual losses to the parents and guardians of the school children of America and to the children themselves were focused into a single line of figures, the result would look like an astronomical calculation.

According to figures given where inspection of school children's teeth have been made in schools, ninety to ninety-five per cent. have defective teeth.

Thousands upon thousands of dollars are wasted each year. Untold suffering, great loss of time in school from toothache, mental disturbances, etc., result because of the ignorance of parents regarding their children's teeth. This suffering and loss of time and money can be stopped very quickly and effectively by the inspection of school children's teeth by a dentist twice a year.

To illustrate the loss in dollars, one of the thousands of cases is cited. A child at the age of six years erupts the first permanent molar. Because of faulty development, a small opening between the folds of enamel at the developmental lines allows decay to progress. No amount of brushing or anything else will save that tooth except a properly inserted filling. Now it is perfectly plain that if that child's teeth are inspected at the beginning and close of the school year, the cavity or defect will be found, and the fault remedied if the parents heed the warning. If, on the other hand, no inspection be held, the tooth continues to decay for a year or more, and the child, after the tooth is nearly ruined, complains of toothache. The dentist is visited. He finds the pulp exposed or putrescent, necessitating tedious treatment and expensive restoration, costing anywhere from five to eight dollars; whereas, if the matter had been brought to the attention of the parent at the start, the cost would not

have exceeded one dollar at most, and very likely less, to say nothing of the loss of time, and pain and suffering of the child.

Dental inspection can be likened to the watchmen in large buildings and factories who make their rounds every hour, pulling the boxes. They are looking for fire. If they find it, the fire department is called and the damage is slight. Just so with dental inspection in schools. The damage to teeth would be very slight indeed. No tooth would decay in six months' time sufficient to cause any real trouble or suffering.

The coming generation would never experience toothache and loss of teeth, if dental inspection in the schools were universal and the warnings heeded. People wearing artificial teeth would be a curiosity in a single generation. If the fathers and mothers knew what it would mean to their children to be free from pain and mental disturbances caused by toothache, they would not only request, but demand dental inspection of the school children's teeth.

Seventy-five per cent. of all contagious diseases enter the body through the mouth and throat, and untold thousands of dangerous death dealing disease germs lurk in unclean mouths and decayed hollow teeth. Make it a part of the regular school work that the children's teeth be inspected twice during the school year, and that they be taught the vital importance of a clean mouth and its relation to good health and a well-founded education.

This program, if followed out, will save human lives. It will prevent death from snatching children from their mother's arms for the reason that the infectious diseases of childhood lurk and grow in the mouths of children many weeks after they have, to all appearances, recovered from a disease. They return to school and play with their mates, and spread disease and death by infecting other children, thus emptying the loving arms of thousands of mothers

every year, and instead of them having the God-given privilege of watching their children develop into manhood and womanhood, they have now the task of visiting a lonely cemetery and placing flowers on a little green mound, and return to a house that is not a home, but which only contains memories of what might have been, and a mass of ruined hopes.

Thousands of children die every year because some child, who had been sick with a contagious disease, returns to school with a dirty mouth. Fathers and mothers of America, remember this, that dental inspection in our schools, and tooth brushes would be much cheaper than funeral expenses and flowers, and children's laughter much preferable to empty arms and aching hearts. Which do you prefer? Won't you start a campaign in your locality for dental inspection in your school? The authorities owe it to every child.

CHAPTER VII.

DENTAL INSPECTION AND CLINICS FOR PUBLIC SCHOOLS—CONTINUED.

THE DENTAL HYGIENIST IN BRIDGEPORT.—THE MORRISTOWN CLINIC.—THE ST. AUGUSTINE CLINIC.—THE DETROIT IDEA.—FORSYTH DENTAL INFIRMARY.—INSTRUCTIONS FOR MAKING SCHOOL EXAMINATIONS.—FORMS USED FOR INSPECTION AND CLINIC WORK.

THE DENTAL HYGIENIST IN BRIDGEPORT.

To the earnest, self-sacrificing and successful efforts of Dr. A. C. Fones, of Bridgeport, Conn., the dental profession is indebted for the greatest movement in regard to preventive dentistry. The event was the graduation of thirty-two women, on June 5th, 1914, as Dental Hygienists. Realizing the great need for women to do examination and prophylactic work in schools, Dr. Fones secured the services of about about twenty specialists who came and lectured for a class. Applicants for admission to the school were carefully selected.

Dr. Fones has one of the best appointed offices in the world. Connected with his office is a private garage for use of himself and patients. This space was turned into a lecture and clinic hall. Full details of the methods of instruction and training employed may be found in a book, "Mouth Hygiene, a Course of Instruction for Dental Hygienists" which contains the lectures given before these classes. The practical training was begun on a most ingeniously arranged

manikin with ink-smeared teeth. As proficiency was attained, children were substituted. (Fig. 31.)

FIG. 31. THE FONES'S METHOD OF TRAINING DENTAL HYGIENISTS BY USE OF MANIKINS.

The course was only given to prove Dr. Fones' ideas correct, and to furnish efficient help and establish a new idea in clinic work in Bridgeport public schools. The policy of this clinic is thus given by Dr. Fones:

"On the 8th of September the work was started in our public schools, twenty-eight in number, and throughout them all we have been cordially received by the principals and teachers. The children have taken very kindly to the treatments and it has been our regret that we could not aid those in the higher grades who wished to have this service.

"The hygienists work in pairs, as a rule, two remaining in the school until all the children of the first grade are given

treatments and some in the second grade, too. It is our intention to give the second grade children one good cleaning during the year in order to have a fairly clean zone ahead of our first grade children.

"The supervisors give tooth-brush drills, oversee the work, look after supplies and give class-room talks to the first and second grades. Each operator is supplied with an S. S. White portable chair, a cabinet, stool and dental engine, besides all the necessaries for sterilization in their work. Their chairs are placed anywhere in the school where they are out of the way, have plenty of light and running water. On stair landings, where they are deep enough to give ample room for marching lines; in the basement, if it is warm and dry and sufficiently light; in cloak-rooms or in hallways, we can always find a place to put the chairs. (Figs. 32 and 33.)

"As they advance to the second grade a corps of dental hygienists will take care of them in their second year of school life. Again in the third year, and so on up to and including the fifth grade. A few additional women will be added to the numbers when needed, so that a child will have its teeth kept clean and polished during the first five years of its school life. If such a system is adopted we will have from the year it is started an army of children with clean mouths in the first grade advancing the next year to the next grade. Again this clean mouthed army will advance into the third grade and so on up to the fifth, pushing before them those who have innumerable decayed teeth. In five years we should have all the children in all grades with will have clean mouths and sound teeth. And if this education and training had meant all that it should, in eight years we should have all the children in all grades with healthy mouths, and the new-comers entering into a definitely formed system.

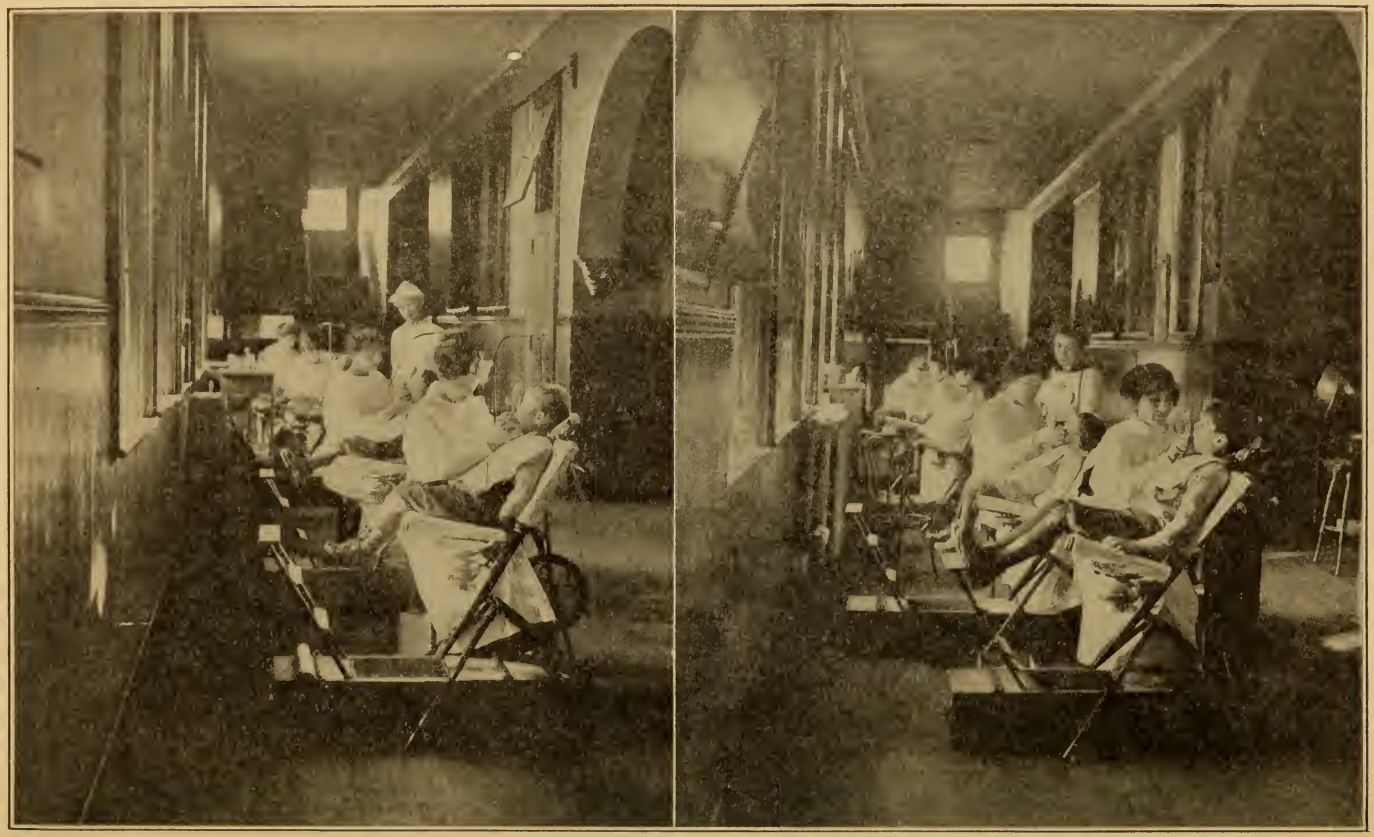


Fig. 32. Miss House and Her Four Assistants Working in Waltersville School.

Fig. 33. Mrs. Hart and Her Four Assistants Working in Waltersville School.

"Now possibly some of this sounds theoretical, but let us look at some facts and figures that may prove we are trying to be exceedingly practical. In the first round through our public schools the corps of eight dental hygienists cleaned and polished all of the teeth of the children in the first grade, and by working after school hours and on Saturday mornings for many of the children in the second grade.

"In closing, I wish to say that this work in the school is chiefly woman's work. The children climb up into the dental chairs with but little fear, as they have confidence that the women will not hurt them. I doubt if this same trustfulness would prevail if standing beside the chairs were eight men instead of eight women. There will never come a time in our civilization when there will be no decayed teeth, but there will come a time, and it is not far distant, when the majority, instead of the very small minority, will have mouths free from dental decay."

One of the first requirements in establishing a dispensary is to eliminate those who are not entitled to free dispensary care. This is accomplished by having the parents of the patient sign a card authorizing the services which is so worded as to eliminate the well-to-do child.

The most important part of the dental clinic is not its mechanical appliances, not its dental operators, not its operations, but the teaching of oral hygienics which should emanate therefrom.

If a child be obstinate or backward in regard to keeping a clean mouth, the nurse should go into that home and instruct the parents about the importance of clean teeth, and see to it that the child is kept under observation until mouth cleanliness is established. Such social service is now the most approved in the modern hospital.

THE MORRISTOWN CLINIC.

A dental clinic was carried through to a successful issue in a very short time by several dentists in Morristown, N. Y.

This work was accomplished largely through the efforts of Dr. H. N. Dodge, who gave the plan publicity by practical suggestions given the daily paper. After gaining the attention of the public, Dr. Dodge and his associates gained an ally in The Bureau of Social Service. Finding that the state law would not allow their municipality to appropriate money for this clinic, they secured popular subscriptions to fit up a first-class operating room. Its maintenance at present is paid for by the same means. The clinic was *incorporated* with ample legal power under the title of "The Morristown Free Dental Clinic Association," January 15, 1915. The high-class of the officers and trustees at once gained the favor of the school authorities, the medical societies and the public. Dr. Dodge says that the next legislature will pass a law enabling the municipal authorities of Morristown to pay the current expenses of this clinic.

The operating room of the clinic was equipped with a Forsyth unit dental chair, the first to be used outside the Boston institution. The experience of other clinics was accepted, and a salaried operator was placed in charge. During the clinic hours the nurse of the public schools becomes a dental nurse. The walls are decorated with tablets bearing appropriate lessons in oral hygiene.

The above description furnishes many new ideas and shows what a well-planned campaign can accomplish in a short time, even in the face of financial difficulties.

In the carrying forward of the work, various operators may have to handle a case before it is finished. As every dentist has some pet way of doing things, it is first essential to establish and tabulate on printed card a routine series of treatments. Thus the patient can be carried through any treatment with several operators without any hesitation or embarrassment of either operator.

The operation of free clinics for dental service is discussed here solely for the reason that they can be made the

greatest factor for oral hygiene teaching. The question has arisen that this part of the work and the great opportunity it affords is often neglected. After the clinic has been established, the local dental societies should see that all new school buildings planned have a room fitted for dental clinic work.

The ideal place for and the ultimate location of the free dental clinic must be in the school building. However, this is not always convenient or possible. Morristown used the former quarters of a photo studio. Some have found quarters and free rent in the city hall, or in the city hospital. Others have used the various dental offices, but this proposition, while it seems feasible, has always delayed the work, and if persisted in, will surely kill any effort toward the establishment of a proper clinic. In the plan of Bridgeport, neither room nor elaborate equipment is necessary. Here, they have proved that a stair-landing serves a good purpose. Study the illustrations given of this method.

We call these clinics *free* and yet it is most desirable that a small charge be made so that the recipient will not be offended by accepting charity. Absolutely free things are seldom appreciated, but if something is contributed to the cost, it is human nature to attach more value to the service. Another point in favor of even a five or ten cent charge is that the aggregate amount will pay for the material purchased to be used in the clinic. However, this does not mean that the clinic should at any time become self-supporting. Where it is not desired to make any specific charge for operations, but where money must be raised, it might prove profitable to have a receptacle conveniently placed, in front of the chair, in order that those who appreciate the work and feel so disposed, may contribute what they feel able to pay. A properly-worded card published in newspapers or sent to patients will help to fill this box.

An editorial in the *New Jersey Dental Journal* for February, 1915, furnishes some matter which is most suggestive:

"Limiting the eligible patients at the clinics to children of school age and the investigations conducted to ascertain if the case is really a deserving one are wise precautions intended to prevent abuse of the charity by those who can afford to pay a regular dental fee. In this way the class of patients for whom the clinics are conducted are assured of treatment and the greater good will be derived by the patient and by the community and by the dentists of the community, for the interest aroused by the work of a clinic is bound to awaken parents who can afford to pay dental fees to the importance of caring for the teeth of their children."

Dr. N. S. Hoff has called our attention to the statistics of the various dental clinics criticising the reports because they show such a small number of operations under the head of "cleaning teeth," as compared with other work done. His suggestion is that every patient present should have his teeth cleaned thoroughly, and should be instructed in oral hygiene. Says Dr. Hoff, in an editorial in the *Dental Dispensary,* August, 1912: "It would seem that nine-tenths of the time and energy of the dentists in charge of these clinics had been expended in relieving the pain of diseased teeth, and repairing the loss of tooth substance. *We are justified in saying that the amount of real hygiene instruction given in these clinics is far short of what it should be,* for the expense of money and sacrifice of time put into it by professional men, of course actual repair and relief operations must be made, but the chief aim of these clinics ought to be to impart instruction that will help these children place the proper value on their teeth, and compel them to give some measure of attention in the way of a systematic mouth toilet."

THE ST. AUGUSTINE CLINIC.

As evidence of improvement along the line of suggestion of Dr. Hoff may be cited the report of the free dental clinic of St. Johns County, Florida. From February, 1914, to February, 1915, there were five hundred and thirty-seven (537) individual patients treated, and of those four hundred and three (403) had their teeth cleaned. The establishment of this clinic is of worthy record.

Mr. J. T. Dismukes, a prominent citizen of St. Augustine, Florida, offered a donation of $1,000.00 towards the establishment of a free clinic for school children of the county, providing the county would furnish the outfit and office. It is to the credit of County Superintendent D. D. Corbett, that he could present the matter before the board of education in such a way that the necessary money was forthcoming. Mr. Dismukes gives $1,000.00 annually for twenty-five years to pay the salary of the dentist in charge. Dr. A. M. Sellers, the efficient dentist in charge of this work, says that the records show the attendance at school has improved and that the general efficiency of the children is better.

The same means is available for any town or city. All dentists have some wealthy patient who probably would be pleased to help his community in this way, if only the matter were presented in a proper way.

THE DETROIT IDEA.

In an address delivered (1914) before the Michigan Dental Society, the superintendent of the Detroit public schools said: "We are having placed in all of the buildings which are to be erected in the future, well-equipped clinic rooms, that is, rooms specially designed by the architect in preparing the plans, where we may have in every one of our new buildings these dental clinics. We do believe that the health of the children is of permanent importance,

and we are trying in every way to foster that health. I believe that the responsibility for this kind of work should be definitely fixed upon the department charged with the general health of the entire city. Only a few months ago, as the result of a suggestion of your Dental Association of Detroit, and through the active interest of one of your number, who happens to be one of the school inspectors of this city, the teachers were instructed to include in the regular marks which are sent home with the pupils, a mark as to the personal and the oral hygiene of the pupil. While I wondered somewhat as to the effect of this particular change, and as to the spirit in which this would be received by the patrons, I am very well satisfied now that that kind of work is helping, and we are accomplishing in that way some of the things which were indicated to-night; that is, we are showing in a very emphatic way to the parents of the children coming to the public schools, that there is something which must be looked out for in addition to the intellectual progress of the child, and that if the personal hygiene of the child is unsatisfactory, or the oral hygiene is unsatisfactory, there is something which needs attention just as emphatically as if the work in arithmetic or reading or spelling, or any other branch, is unsatisfactory. I had a number of indignant messages after the first reports were received. A number of parents were decidedly insulted, and came to see us concerning this departure. They said it was an outrage, and that the teachers should apologize to the parents for sending reports of unsatisfactory conditions. But I have noticed, on the other hand, that in many cases there has been very greatly increased attention given to those very things. And human nature being as it is, when the children discover that if those things are neglected there is going to be a mark of 'unsatisfactory' on their report, which is otherwise spotless, there is apt to be some very strong pressure on the part of that child in the way of having these defects eradicated.

We instructed the teachers that if the dental inspectors reported to them that there were faulty conditions in the mouth, until those faulty conditions had been corrected, and evidence that that correction had been made received through reports from the home dentist or from the dental clinic, the report 'unsatisfactory' was to be continued."

This view is correct, and it is to be hoped those who have such work in charge will realize the facts, and take advantage of their great opportunity for spreading the gospel of clean teeth.

THE NEW FORSYTH FREE DENTAL INFIRMARY.

The Dental Infirmary erected in Boston, and dedicated to the needs of children is now the model institution for all the world.

The site and building cost half a million dollars, and is endowed with $1,000,000.00 for its maintenance. It is furnished with the latest and best dental equipment, including a lecture hall for the teaching of oral hygiene to the public. The institution is doing what the trustees started out to accomplish, that is, an aid for "A better looking, more perfectly developed race." (Fig. 34.)

Dr. G. W. Clapp, by editorial in the *Dental Digest,* thus discusses the oral conditions in their relation to community hygiene:

"In America we have not yet reached so enlightened a condition; our oral hygiene clinics are mostly conducted as charities by the efforts of a few noble-minded practitioners and the aid they solicit. In the light of experience here and abroad it is probably safe to say that this is neither a just, a wise, or a safe foundation for such enterprises, save in instances like the Forsyth Infirmary, where a great endowment insures permanency and adequate equipment. Community oral hygiene is not the burden of the dental profession. It may be our duty to prove its merits, to show what

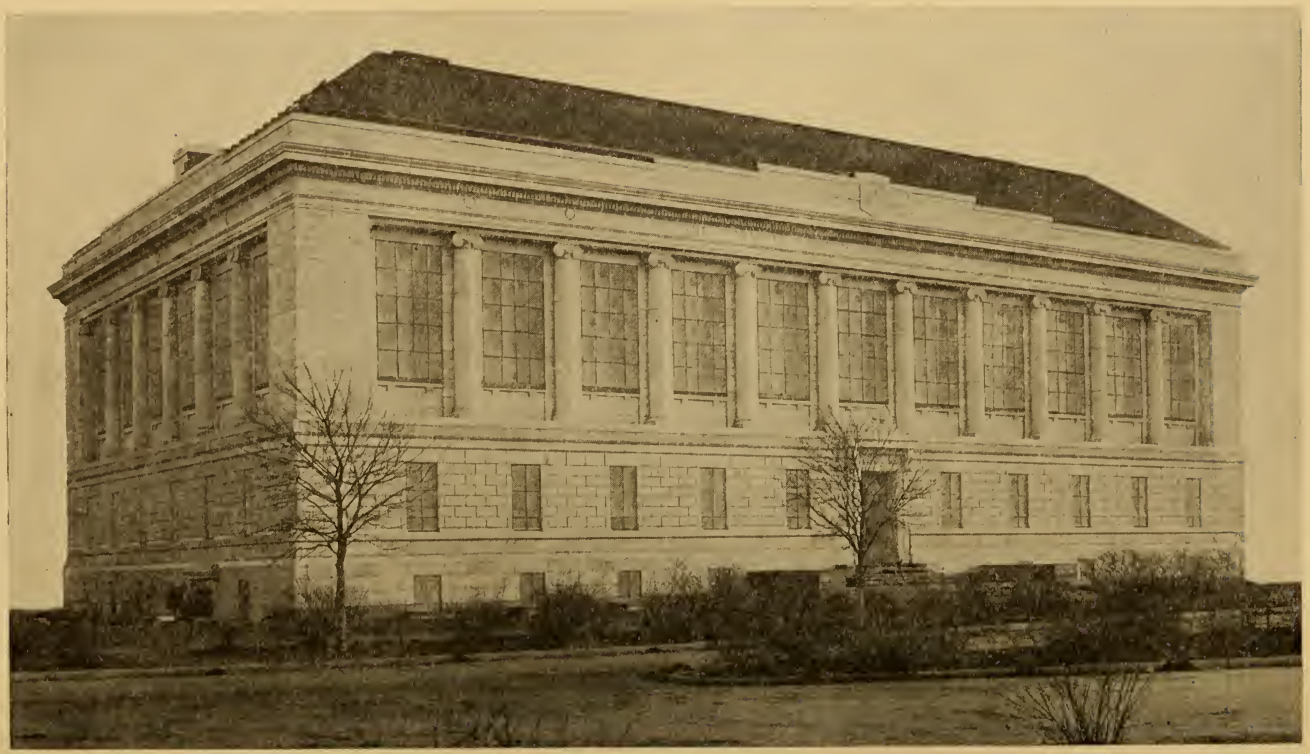


Fig. 34. Forsyth Dental Infirmary for Children.

it can do for the community and to assist in its establishment by all the means in our power. But to look forward to its permanent conduct by dentists is to insure that it will fail of its greatest usefulness.

Fig. 35. Interior View of the Forsyth Dental Infirmary.

"Community oral hygiene is of right a community enterprise. It has more to do with the health of the persons comprising the community, with their economic efficiency, and the return which they shall make to the community, than almost any other single measure. In the minds of those who have studied it most, it will prove an economy rather than an expense. It is not impossible that within the childhood of those who benefit by it, it will save its cash cost to the community in freedom from disease, in improved at-

tendance of children at school, in greatly improved mental ability, and in reforming juvenile criminals."

FORMS USED FOR INSPECTION AND CLINIC WORK.

Dental inspection and record must preceed any attempts towards the establishing of a dental dispensary. The literature and forms as used as Cleveland, Ohio; Rochester, N. Y.; Denver, Detroit, and Cincinnati furnish efficient forms, some of which are illustrated.

INSTRUCTIONS FOR MAKING DENTAL EXAMINATIONS IN THE CLEVELAND PUBLIC SCHOOLS.

Examiner should work in harmony with the principal of the school and should himself make all arrangements for the examinations with the principal.

Examiner should secure from the principal the use of one table, two chairs, wash basin, hot and cold water, and a suitable place in which to keep his outfit from week to week.

Examiner should see that principal understands the instructions for her teachers, viz: The teacher should insert carbon paper between the first two blanks and then proceed to supply the

School
Date (of examination)
Name (of pupil)
Address (of pupil)
Age Grade Room No.

for each pupil. *Always in duplicate;* arranged as the children sit in rows in their class. The children should be supplied to you for examination in the same order in which the blanks have been prepared. Always keep one or more of the children in line but never have to exceed five waiting; one or more dispels fear, too many provoke mirth. teacher should not detach blanks. The blanks should come to you in pad form. When you have made your record, using same carbon paper as teacher, remove the top sheet, giving this original to the pupil, fold over the pad the duplicate and later send same to the secretary of examinations. You will find that one hundred examinations will be all that you can care for in one morning of three hours until you have had some experience. There

will be sent to each school with examination blanks, four carbon papers so that four teachers may prepare for coming examinations at the same time. These carbon papers should be left by the teacher in the pad of blanks. You will need them for your work. When you have finished examining for the day, be sure to return the four carbon papers to the principal for future use.

Examiner should be prompt in attendance.

Examiner should have his person neat (wear office coat) and above all his hands and nails should be mechanically clean. He should see that his mouth is clean as an example, and his breath should be sweet.

Examiner must not use tobacco when on school property.

Examiner should use a pad of blanks for each room.

Examiner should examine with his back toward a window, that he may have good direct light in the pupil's mouth.

Examiner must keep his hands out of pupil's mouth.

Examiner must *not* use any instrument except a mouth mirror.

Examiner must *not* use a mirror but once until resterilized.

Examiner should see that vessels containing carbolic acid and alcohol are labeled at all times.

Examiner should see that sterilizing is properly done and that mirrors are free from both carbolic acid and alcohol and are at a temperature that will be comfortable to the mouth and not fog the glass. This will necessitate frequent change of hot water in the last glass. *Proper sterilization* of mirrors for this work will consist in: 1st, Washing with a brush, in hot water and soap. 2d, Immersion in carbolic acid solution (as provided which is 1 to 64) for at least five minutes. 3d, Immersion in alcohol (95%) (alcohol must be at least one-half inch deeper than carbolic solution). 4th, Immersion in hot water until used. This water should be changed at least once for every thirty mirrors passed thru it. Mirrors should be used wet and not touched with the hand, napkin or otherwise.

Examiner should always leave his outfit clean and as nearly ready for use as possible. Carbolic acid solution and alcohol should be thrown into sewer at close of day's work.

Examiner must provide: Six (6) mirrors (Ash mirrors may be had for 50c each or 6 for $2.50, at Ranson and Randolph's.) Three large drinking glasses for alcohol, carbolic acid, and water. Six (6) pencils. Towels for personal use. Soap. Basin and brush for scrubbing mirrors. One tray to receive soiled mirrors. An assistant to sterilize the mirrors.

FIG. 36. PROPER ARRANGEMENT OF TABLE FOR SCHOOL INSPECTION WORK.

Examiner will be furnished with a card of appointment which he should carry on his person.

Examination blanks, alcohol, carbolic acid, and labels for the same will be furnished and will be delivered to the principal of the school.

The Oral Hygiene Committee will pay assistants at the rate of 50c per half day which means three hours' work.

Should examiner be unable to provide an assistant, one will be furnished him upon request.

Do not examine Kindergartens.

Examine 1st grades first, and 8th grades last. Never force a child to submit to examination if parents object. If parents object, so mark his chart and send original home.

If child is afraid have him first see you examine another, after which you will have no trouble.

DETAIL OF A DAY'S WORK.

Examiner and his assistant should be at the school at 8:15 a. m. and should at once notify the principal that he will be ready for work at 8:30.

Examiner and his assistant should prepare his table after the fashion shown in the enclosed blue print. Begin work promptly and continue steadily until recess, at which time a few minutes relaxation in the fresh air will be found beneficial. After recess resume work until close of morning session. Have assistant clean and store all utensils properly. Make out your report and wrap with pads of examinations. Pay your assistant; the society will pay you. Have her receipt for it on your report. Inform your principal of your next appearance and depart. In most convenient manner send your report and blanks to the secretary of Examinations. Should you need any supplies notify Sec'y of Exams at once. Call Main 517.

Examiner should not ask pupil if he has a family dentist.

DENTAL EXAMINATION OF SCHOOL CHILDREN, CLEVELAND, OHIO

MADE UNDER THE AUSPICES OF

The Cleveland Dental Society, The Ohio State Dental Society and The National Dental Association

FRONT OF TEETH.

School .....

Date .....191...

Name .....

Address .....

Age.....Grade.....Room No.....

Condition of Mouth	Good	Bad
Condition of Gums	Good	Bad
Use Tooth Brush?	Yes	No
Teeth Filled?	Yes	No
Mal-occlusion?	Yes	No

REMARKS:

.....

.....

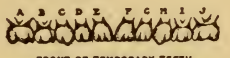
.....

.....

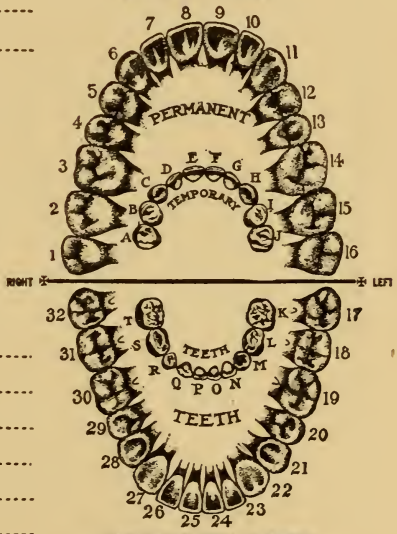
.....

.....

.....



BACK OF TEETH.



EXPLANATION OF MARKS ON DIAGRAM.

Line through tooth means cavity or cavities.
O—Loss of crown.
X—Permanent tooth lost.

TO PARENTS—A sound body and sound mind are usual and frequent companions. Schools are therefore concerned with both. Neglect in care of the teeth is the cause of so much ill health that school authorities everywhere are seeking co-operation with competent dentists. Our Board of Education has arranged with the local dentists for a free examination of the teeth of all school children. The report on your child is shown above.

This examination and report (though not complete) is not an attempt to interfere with your private matters. They will bring to the majority of the parents first knowledge of the fact that their children's teeth need the attention of a dentist. It is our belief that all parents will be interested in having their regular dentist look after the defects pointed out by this report.

Very truly yours,

W. H. ELSON, Superintendent of Schools.

'over]

FIG. 37. CLEVELAND DENTAL EXAMINATION FORM FOR SCHOOL CHILDREN.

ABOUT TEETH.

Good Teeth, Good Health.

Without Good Teeth there can not be thorough MASTICATION.

Without thorough mastication there can not be perfect DIGESTION.

Without perfect digestion there can not be proper ASSIMILATION.

Without proper assimilation there can not be NUTRITION.

Without nutrition there can not be HEALTH.

Without health what is LIFE?

Number of Teeth

There are twenty teeth in the first or temporary set—10 upper and 10 lower. In the permanent or second set there are 32 teeeth—16 upper and 16 lower.

Their Purpose.

The teeth are for ornamentation, for grinding the food, (thus preparing it for proper digestion), and assistance in talking. They should last to the end of life.

How Lost.

By decay and loosening. Decay is caused by allowing food to remain about the teeth and by poor health. Teeth become loose by a deposit on them at the edge of the gum, called tartar.

How Can Decayed Teeth and Diseased Gums be Prevented?

By cleaning the teeth with a tooth brush and water on arising in the morning and before going to bed at night. A quill toothpick properly sharpened, should be used after each meal. A toothpowder used on the brush will assist in cleansing the teeth.

The essential ingredient in all good tooth powders is precipitated chalk. This may be flavored to suit the taste. The following formula is considered a good one:

Precipitated Chalk .....3½ ounces.
Pulverized Castile Soap ..... ½ "
Garantos .....1 grain.
Flavor with Oil of Peppermint,
Sassafras, Wintergreen or Cinnamon.....5 drops.

The slow and thorough chewing of the food helps to preserve the teeth and keep the mouth in a healthy condition.

Every person should have his teeth examined by a competent dentist several times a year.

Cleanliness is the best guard against disease.

FIG. 38. BACK OF FORM, FIG. 37, FOR DENTAL EXAMINATION OF SCHOOL CHILDREN.

BOARD OF HEALTH

Dental Inspector's Daily Report

School..... .....191...

Grade ..... No. Examined.....

No. needing immediate attention.....

General condition found { Good ..... Fair..... Bad .....

Remarks .....

.....

.....D. D. S.

FIG. 39. FORM USED FOR DAILY REPORT OF INSPECTOR.

CINCINNATI DENTAL ASSOCIATION

I, parent or guardian of.....
herewith request the nurse of the Department of Health to take my child to Free Dental Clinic for treatment, and give her power to act according to the advice of the attending physician.

Signed:.....

Treated by		REMARKS
.....	Family Dentist	.....
....	Clinic	.....
.....		.....
.....		....
Visits to		....
....	Home	....
.....	Clinic	.....
.....	Other	....
Results		....
.....	Recovered or improved	....
.....	Refused treatment	....
.....	Pending	.....
.....		.....
.....		.....

Date of Discharge.....

Nurse .....

FIG. 40. A RECORD FORM USED AT CINCINNATI.

SCHOOL.....

.....1910

Grade.....Room Number .....

Name..... Age.....

Address.....

RIGHT	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	LEFT
	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	

Does Child use Brush? Yes..... No.....

Condition of Mouth? Good..... Fair..... Bad.....

Condition of Gums? Good..... Fair..... Bad.....

Condition of Temporary Teeth? Good..... Fair..... Bad.....

Family Dentist? Yes..... No.....

Teeth Filled? Yes..... No.....

Mal-Occlusion? Yes..... No.....

Remarks.....

.....

.....

Disposal of Case.....

.....

Examined by Dr.....

FIG. 41. AN EXAMINATION FORM USED AT CINCINNATI.

To begin school inspection or clinic work it is a good idea to secure a collection of the forms as used in several of the larger cities. A letter addressed to the Board of Health in each city with such a request will generally receive prompt attention. From such a collection of material can be selected forms suitable for the new work. The tendency at first is toward getting too much matter on the form. This must be guarded against and the most simple forms possible should be selected.

The most important form is the one to be sent the parent. This should always bear some simple truths about the teeth and their care. This form is best printed on cardboard, as a paper sheet is sooner destroyed. After the forms are selected the next step is to adopt some permanent filing system as the accumulated statistics are valuable.

ROCHESTER DENTAL SOCIETY -- FREE DENTAL DISPENSARY No. 2
Card of admission on representation or statement of patient.

Name Mary Barnes Address 12 Cypress St.

Date 1/14/12 School No. 14 Grade 5th Teacher Miss A. Engle

Nativity M English / F German Where Born U.S. Age 13 Color White

No. in Family 5 Income $10.00 Rent $3.50 wk Medical Attendant Dr. H. T. Jones

Name of Parent or Guardian John W. Barnes Employer A. S. Green Certificate? X

Father	Mother	Applicant	Mental	No. Teeth	Defective	Percent
Good	Tb.	Sickly	Normal	28	7	25%..

Dentifrice?	Brush?	Irregular?	Saliva?	Mouth Breather?	Remarks
No	Yes	X	alk.	yes.	adenoids

This is my 1st application to this Dispensary in the year 1912 I have been an applicant to no other Dispensary in the year 1912 (or to the following Dispensaries) General Hospital – Eye Clinic

The foregoing statement is in all respects true;

Signature of applicant Mrs. A. E. Barnes.

Sent by Miss A. Engle Address 34 White St. Telephone No. 1429 K

Investigated 1/16/12 O.K. (Name) Admitted 1/19/12 Refused X

TAYMAN & ERBE MFG. CO., ROCHESTER, N. Y. 405821 3M 1-10

FIG. 42. CARD OF ADMISSION.

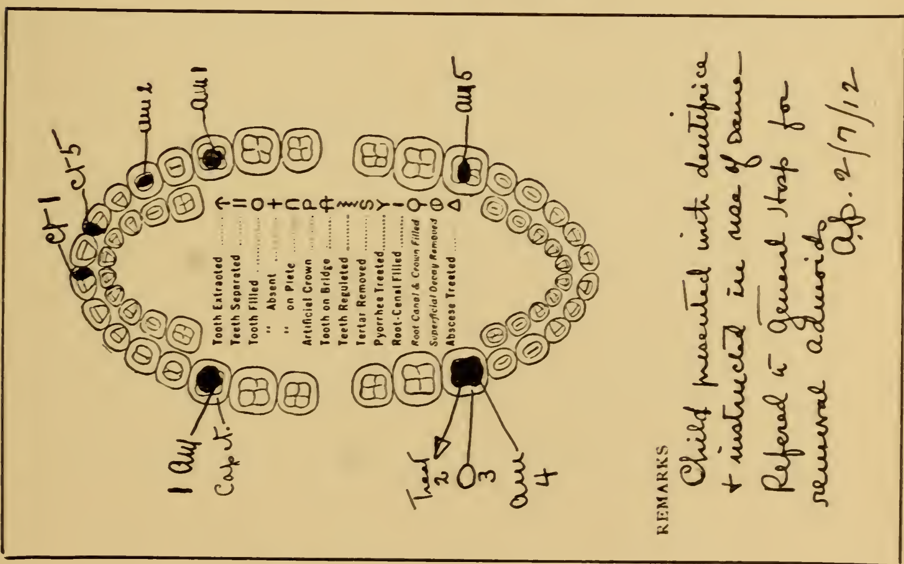


FIG. 43. BACK OF CARD OF ADMISSION.

Rochester Dental Society—Free Dental Dispensaries

O Clifford, Thomas and Weeger Streets
School No. 26

☒ Scio St. cor. University Ave.
School No. 14

O 32 S. Washington Street
Rochester Public Health Asso.

Name Mary Barnes

Address 12 Cypress St.

No. in family 5 Income $10.00

Employer H. S. Green

Rent $3.50 per wk.

School No. 14

Sent by Mrs. A. Engle

Monday	1/29/12		
Tuesday			
Wednesday			
Thursday			
Friday	Jan	19	2 PM
Saturday			

Signature of Parent or Guardian Mrs. A. E. Barnes

ALWAYS BRING THIS CARD WITH YOU (over)

FIG. 44. ENGAGEMENT AND RECORD CARD USED AT ROCHESTER.

PENALTY FOR FALSE REPRESENTATIONS.

Section 25, Chapter 368, Laws of 1899.

Any person who obtains medical or surgical treatment on false representations from any dispensary licensed under the provisions of this act, shall be guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not less than ten dollars and not more than two hundred and fifty dollars.

(Imprisonment until fine be paid may be imposed. Code Crim. Pro. Section 718.)

FIG. 45. BACK OF FIG. 44.

In writing about the dental clinics of Detroit, Dr. Oakman says: "All lectures are illustrated by lantern slides. When possible photographs are taken of interesting cases, both before and after treatment, and preserved as a matter of record.

"Weekly reports of all inspections and operative work are sent to the chief inspector, and a duplicate to the board of health. An imaginary fee is placed on all work done in the clinics, whereby we are enabled to estimate the relative value of each operator to the department. Without this we could not arrive at a proper conclusion as to the value of the work done by each individual."

Detroit Board of Health

To Parents and Guardians:

Diseases of the teeth have been named "The disease of the people."

The widespread existence of this disease and the great injury it does to the health of the child make it one of the greatest factors in deciding the child's future.

The cure of the disease calls for the strong, united action of all persons having the care of children.

GOOD HEALTH DEPENDS UPON GOOD TEETH BECAUSE

1. There cannot be health without nourishment.

2. There cannot be nourishment unless the teeth break up (chew) the food so that the body can digest the food.

3. There cannot be good digestion unless the teeth are able to break the food, and bad teeth cannot do good work.

4. If there is not good digestion there cannot be good health. Medical investigations show that much of the disease of the teeth can be PREVENTED; also that the younger the child when the teeth are cared for, the greater the benefit.

All this means that if the first, or temporary set of teeth, could be kept free from disease, the second or permanent set of teeth would be practically sound.

Children enter school life just before or during the most important dental period; namely, the cutting of the FIRST MOLAR TOOTH. THIS IS THE FIRST PERMANENT TOOTH.

This first tooth of the second set will not be healthy and sound if the first set of teeth is decayed or neglected. The other teeth of the second set will not be healthy if this first molar is decayed.

The one great cause in all decay of teeth is THE FAILURE TO KEEP THEM CLEAN.

There was a time when the wheat used for flour was not so finely powdered as it is today, and when modern inventions had not robbed bread of a coarseness that made the teeth clean and strong by chewing. The finely powdered wheat flour bread clings to the teeth and sets up fermentation. This causes decay of the teeth. This decay goes on faster during the night than during the day.

Teeth SHOULD be cleaned after each meal, but MUST be cleaned before going to bed each night if decay is to be prevented.

Teeth can be cleaned by BRUSHING or by passing silk floss between the teeth.

Many children neglect to do this; then it becomes necessary to have the teeth cleaned and repaired by a dentist.

The Board of Health has gone over the whole problem of the care of the children's teeth and has prepared a plan which, it believes, will aid the children greatly in promoting good health.

The task is a big one and requires the co-operation of parents and teachers if the best results are to be gained.

Each parent or guardian is asked to assist in this work which means so much for the future of the children.

1. You are asked to buy a tooth brush for each child in the family.

2. You are asked to see that the child uses this TOOTH BRUSH DAILY, especially before going to bed at night.

3. You are requested to take your child to your family dentist for examination and for treatment. If circumstances do not permit consulting a dentist at his office, the child may be treated free at one of the following dental clinics. You are asked to do this NOW:

Board of Health, 733 Antoine St.	8:30-12:00, 1:00-4:00 Daily
Bishop School, Adelaide & Rivard St.	8:30-12:00, 1:00-4:00 Daily
Newberry School, 29th near Jackson	8:30-12:00, 1:00-4:00 Daily
Grace Hospital, John R. and Willis	8:00-11:00, 1:02-4:00 Daily
Neighborhood Settlement, 4th & Porter	8:30-12:00, 1:00-4:00 Daily
Solvay Guild Hall, Delray	8:30-12:00, 1:00-4:00 Daily
Franklin St. Settlement, 519 Franklin	8:30-12:00, Mon., Wed. & Sat. 2:00
Greusel School, Moran & Medbury Sts.	8:30-12:00, 1:00-4:00 Daily
Harper Hospital, 500 John R.	8:30-12:00, 1:00-4:00 Daily
House of Providence, Blvd. & 14th St.	8:30-12:00, 1:00-4:00 Daily
East Side Settlement, 101 Superior Ave.	8:30-12:00 Daily

Date.....

Dear.....

You are hereby notified that the dental examination made of..... .....under the direction of the Detroit Board of Health shows necessity of treatment for

.....

.....

Please consult your dentist.

....., Principal

..... School

FIG. 46. A TWO-PAGE FORM OF INFORMATION USED BY DETROIT.

DETROIT BOARD OF HEALTH

WEEKLY REPORT DENTAL CLINIC

DETROIT._____ 191____

PATIENTS			Prophylaxis	Amalgam Filling	Cement Filling	Gutta Percha Filling	Roots Treated	Roots Filled	Arsenic Treatment	Putrescent Pulps Treated	Abscess Lanced	Abscess Treated	Abscess Cured	Odontalgia Treated	Extracted		
	New	Old													Temp.	Perm.	Gas
No. Cases																	

Mon. A. M._____ P. M._____
Tues. A. M._____ P. M._____
Wed. A. M._____ P. M._____
Thu. A. M._____ P. M._____
Fri. A. M._____ P. M._____
Sat. A. M._____ P. M._____

CLINIC_____

NURSE_____

OPERATOR_____ D. D. S.

FIG. 47. DETROIT WEEKLY REPORT DENTAL CLINIC.

Dr. Henry F. Hoffman furnishes the author the forms used in the city of Denver. He writes: "We think our plan more nearly meets the ideal than any other possible arrangement, as the school authorities have better control over the children than even the parents in many instances. Politics are eliminated to a greater extent than would be possible in a purely municipal clinic, and it is relatively easy to restrict patrons to those who are really entitled to its benefits.

"The Denver School clinic is now operated entirely by the school board, the Denver Dental Association having released the management of it for the past year, although the profession still takes an active interest. The plan which is in operation here may be adopted to advantage by any community."

A few of the Denver forms are shown. Those not shown are similar to those illustrated of other cities.

DENVER PUBLIC SCHOOLS
School District Number One, in the City and County of Denver, Colorado.

ATTENDANCE DEPARTMENT
Margaret T. True, Supervisor

MEDICAL INSPECTION

Instructions Regarding Care of Mouth and Teeth

The physical examination of school children shows that in many instances the teeth are in a decayed and unhealthy condition.

Decayed teeth cause an unclean mouth. Toothache and disease of the gums may result.

NEGLECT OF THE FIRST TEETH IS A FREQUENT CAUSE OF DECAY OF THE SECOND TEETH.

If a child has decayed teeth, it can not properly chew its food. Improperly chewed food and an unclean mouth cause bad digestion, and consequently poor general health.

If a child is not in good health, it can not keep up with its studies in school. It is more likely to contract any contagious disease, and it has not the proper chance to grow into a robust, healthy adult.

IF THE CHILD'S TEETH ARE DECAYED, IT SHOULD BE TAKEN TO A DENTIST AT ONCE.

Each parent or guardian is asked to assist in this work which means so much for the future of the children.

1. You are asked to provide a toothbrush for each child in the family.

2. You are asked to see that the child uses this TOOTHBRUSH DAILY, especially before going to bed at night.

3. You are asked to fill out and sign the attached form so that the school nurse may give any assistance required in any case. This will be regarded as confidential.

Approved by

WILLIAM H. SMILEY, Superintendent.

DR. PEARL WHEELER DORR, Medical Inspector.

Fill Out and Tear Off this Slip and Return it Immediately

.....191...

To the principal of.....School

A.....

.....a pupil in Grade.....is receiving treatment at

Dr. ..... or at Dental Clinic, Longfellow School.

B. I desire.....a pupil in Grade.....to receive dental treatment at Dental Clinic, Longfellow School.

I assume the responsibility of such visits. I can not pay minimum cost of treatment.

.....
Parent or Guardian.

FIG. 48. THIS CARD IS GIVEN THE SCHOOL CHILDREN OF DENVER.

DENVER PUBLIC SCHOOLS

School District Number One in the City and County of Denver, Colorado

WILLIAM H. SMILEY, Superintendent

.....School. Denver, Colo.,.....

Mr.....

Dear Sir:

An examination of.....
made in compliance with the School Law of Colorado seems to indicate defectiveness.....
The law requires examination by some competent physician, and treatment if necessary. Will you kindly have such an examination made, and return this notice with the physician's report properly made out on the back of this card. Respectfully,

.....Principal.

FIG. 49. THE DENVER EXAMINATION CARD.

REPORT OF PHYSICIAN

I have examined.....in accordance with your notice to the parent, and find the following conditions and have instituted the treatment as noted.

.....

.....

.....

.....

(Signed).....

Physician

Address.....

FIG. 50. OPPOSITE SIDE FIG. 49.

*TOOTH BRUSH DRILL

Attention:

(All in line, elbows close to side, with brushes in right hands and cups in left.)

1. Ready Dip.

2. Outside surfaces. (Brush inserted under cheek and teeth closed. Motion, circular including upper and lower teeth and gums.)

Left Side	Ready	(Count)	1—16	Dip
Right "	"	"	1—16	"
Front	"	"	1—16	"

3. Inside Surfaces. (Mouth wide open, straight motion, front to back.)

Upper	Left Side	Ready	(Count)	1—16	Dip
"	Right "	"	"	1—16	"
"	Front	"	"	1—16	"
Lower	Left Side	Ready	(Count)	1—16	Dip
"	Right "	"	"	1—16	"
"	Front	"	"	1—16	"

4. Chewing Surfaces. (Scrubbing vigorously.)

Upper	Left Side	Ready	(Count)	1—16	Dip
"	Right "	"	"	1—16	"
Lower	Left Side	Ready	(Count)	1—16	Dip
"	Right "	"	"	1—16	"

5. Rinse brush. (Shaking off excess water on edge of cup.)

N. B.—Counting by leader should be rather brisk, but even and allowing plenty of time for dipping and shaking brushes.

Materials:

1. Tooth Brushes—not too large for children's mouths.
2. Individual cups (paper preferably) to be half filled with water by monitor.
3. One or two large pitchers of water, each in charge of a monitor who half fills the cups.

*Suggested by the Committee on Public Health and Education of the Second District Dental Society, Brooklyn, N. Y., from whom additional copies may be obtainable.

FIG. 51.

Fig. 52. The Rinsing Room—Strasburg Dispensary.

CHAPTER VIII.

TUBERCULOSIS AND THE ORAL HYGIENE MOVEMENT.

As has been pointed out again and again one of the greatest fields of dental work is that of preventive dentistry; from the present trend of medical science, it appears that an important branch of this work in the future will be that of aiding in the fight on the "Great White Plague." Observations have shown me that the vast majority of patients who have contracted tuberculosis, have unclean mouths, and, on the other hand, I believe the patient with the well-cared-for mouth is better able to resist this infection.

The only successful treatment so far, depends on the use of fresh air, plenty of good food, pure water, and rest. The most important of these is proper feeding, and proper feeding depends on proper mastication. Complete and proper mastication can not be accomplished unless the patient's mouth is in a healthy condition. Ulcerated teeth, flowing pus from pockets, exposed pulps in teeths, and two-thirds of the teeth out of the jaw or out of service, will not give the proper nutrition even from the purest foods obtainable.

The pure air of a pine forest, passing through a septic mouth, is no better than the air of a crowded tenement.

Statistics show that fully seventy per cent. of school children have enlarged glands. This means either a form of tuberculosis or else a predisposition towards that disease. A large per cent. of these can not have other than dental entrance for these poisons, for most of them have open root canals. This has been demonstrated before the German

Surgical Society by the process of inoculating the pulps of children's teeth.

In the crusade against the "Great White Plague," there is not enough stress being laid on the question of oral sepsis as a causative factor for this disease, nor is importance enough attached to its worth towards a cure of these patients. This matter should be brought to the attention of the heads of the various institutions which treat tubercular conditions, and also the authorities who control the charity institutions. It is our duty to convince these people of the great benefits that dentistry can accomplish for those under their care.

A few years ago, the writer became interested in a free dental clinic for the "Atlanta Anti-Tuberculosis Association," which was operating a free medical clinic. He brought the matter before the Medical Society, and then the Dental Society, finally securing the equipment for running the clinic. At first the members of the Atlanta Dental Society took up the work at stated intervals. At the present time the Society has a regular clinician of stated salary to do this work. Reports show a great number of filling operations with a very small per cent. of oral hygiene treatments. This criticism, of course, applies not only to this clinic, but to all others of this kind that have come under the writer's investigation. Not long ago Dr. Hoff criticised a report of a similar case in like manner. I hope that in the future, those who have these institutions under management, will bear in mind that the stressing of oral hygiene is of more practical value than dental restoration to the patients. This is not meant to discourage dental work, but it should be, undoubtedly, made secondary, while it is at present primary. Every patient who presents for dental attention, should have his mouth thoroughly saturated with some antiseptic solution. The clinician should not examine the patient's mouth until this has been done. Each one of these patients should have

his teeth cleaned up and treated with Iodine solutions until oral sepsis conditions are cured. Not only this, but every one of them should be instructed in the use of the tooth brush, and made to show improvement in mouth conditions. The method adopted in reference to tooth brushes in Atlanta is to buy seconds from the tooth brush manufacturers, and sell them to the patients at cost.

In clinics, which I have visited, I noticed that in the medical room there are always charts and pictures, showing the patients what and how to eat, and how to take care of themselves. In the dental clinic a like method should teach them how and why they should keep their mouths clean. It is now known that more trouble comes from septic mouths than from dental caries. I have frequently noticed that these septic mouths do not present as large an amount of caries as do mouths under normal conditions. Cards should be distributed in the dental clinic, calling attention to the importance of this fact, also cards explaining the proper use of tooth brush, and dentifrice cream, should be given to the patient. If this take all of the time of the clinician, then the dental colleges and other clinics of like nature would be only too glad to get the regular dental work to do. It takes an expert to handle the oral hygiene part of the work at this kind of clinic. If our dentists could only see the matter in this light, and quit paying all their attention to filling teeth, I believe that the medical men would soon rally to the cause and place in every institution dentists to do this kind of work. While there are medical authorities who recognize, to the fullest extent, the importance of this matter, not until it is generally recognized will the condition improve as it should.

Drs. Weidmann and Lubowski say:

"There is no disease in which healthy and clean conditions of the mouth are of such vital importance as in tuberculosis of the lungs. Tubercle bacilli are found in carious

cavities, and it has been proved that especially unclean portions of the mouth constitute a portal of entrance for the tubercular poison. Partsch, of Breslau, reports a case of grave tuberculosis caused by a carious tooth with such acute inflammation of the lymphatic vessels that an operation became necessary. Also many cases of tuberculous infection by way of the alveoli have been reported. These and the authors' own observations leave no doubt as to the fact that dental caries are responsible for many cases of tuberculosis. Tuberculous tumors situated opposite carious teeth resist every treatment until the carious teeth are filled or extracted. Long-established lymphatic swellings also will generally not yield until the carious teeth are treated. All the generous efforts of charitable and public institutions for the cure or prevention of tuberculosis are of no avail unless the causes of the disease are removed, and among the most dangerous causes are beyond doubt defective teeth and unhygienic oral conditions which exist especially in children."

S. Adolph Knopf, Professor of Phthisio-Therapy at the New York Post Graduate Medical School and Hospital, of New York, writes:

"It must be said to the glory of the American achievements that dental science, the art of preserving the teeth by truly scientific method, had its birth in this country. While we physicians have gone to Europe to complete our education, the European dentist comes to America to learn the best and latest in his profession. The latest and most glorious development of the American dental science is dental hygiene, for dental hygiene means prevention and preservation, and these bear the closest relation to the prevention of tuberculosis.

"One of the earliest and very frequent symptoms of tuberculosis is impaired digestion. While I do not wish to say that bad teeth constitute the only cause of digestive disturbance, if bad teeth are present, they are a factor contribu-

ting to this pathogenic condition. Ulcerated teeth may give entrance into the bone of tubercle bacilli that have been accidentally inhaled or have been contracted by secondary infection."

In a later address before the Fourth International Medical Congress, held in Washington, Dr. Knopf used even a stronger statement: "I defy the most skilled physician to either help or cure a tubercular patient who has decayed teeth in the mouth."

Prof. Fisher, of Yale, is authority for the statement that, "Seventy-two Americans die every hour from preventable diseases." Counting this up for a year, we are amazed at the glaring fact of this needless mortality which we have here in our country. Enough people might be saved each year to populate a city the size of Baltimore, and the further fact is that at any time these deaths may come near to our own doors. A large per cent. of these deaths come from dental origin, and makes it necessary for the dental profession to "sit up and take notice."

Drs. W. G. Ebersole and Marshall have declared that decay of the teeth is *the most prevalent disease of civilization,* and that there are thousands of invalids who are such because of faulty oral conditions. They also believe that all the medical treatment in Christendom could not cure them. It is not for the dental profession nor the medical profession to claim the whole field for the work, and, even together, we can hardly make a successful fight unless the sympathies of the people are gained, and they work with us against the great common foe—the "Preventable Diseases."

CHAPTER IX.

BRUSHING THE TEETH.

SHAPE OF THE BRUSH.—TEACHING THE TECHNIQUE OF BRUSHING THE TEETH.—THE DIRECTION CARD.—THE CARE OF THE TOOTH BRUSH.—THE PROPER USE OF THE TOOTH PICK.—THE USE OF DENTAL FLOSS SILK.—THE BAD BREATH SIGNAL.—LIME WATER AS A MOUTH WASH.

Tooth brush handles at the present time are made of bone, purchased from the Chicago Stock Yards. The best grade handles are made from the thigh, and the cheaper ones are made from the shin and buttocks bone. The back is grooved, holes are drilled, and then wire is drawn through, pulling the bristles into place. The grooves are then filled with cement.

The best bristles come from Russia, India, and Germany. They are washed, bleached, cut into proper size selected, and graded. In one tooth brush factory, I am informed, some of the graders have been employed for twenty years at the same work.

SHAPE OF BRUSH.

As to the shape of the brush, we have every variety described, from the sway-back brush to its opposite, the curved handled brush in the so-called "Prophylactic Tooth Brush." In shape they vary from the largest, as prescribed by Dr. D. D. Smith, to the smallest one, described by Dr. Jules J. Sarrazin. In texture, they range from the softest brush, prescribed by the author, to the stiffest brush, prescribed by many of the leaders of the profession. Each dentist has

some peculiar idea upon the shape and size of the brush, but this will have little bearing upon the subject as to cleaning the teeth.

TEACHING THE TECHNIQUE OF BRUSHING THE TEETH.

There is, however, one point upon which they will all agree, and that is the training of the patient into the proper brushing of the teeth. It is surprising to note the ignorance of our best patients upon the handling of the tooth brush. It is even more surprising to note how few dentists take any time to train these patients. I have made it a point to inquire always of new patients whether or not their former dentists taught them to use the tooth brush properly. Very seldom do they answer in the affirmative. However, asking the question, in most cases, is superfluous. The appearance of the teeth tells us all that we want to know.

It is a good idea to have brushes in the office for sale to our patients, for, if we give them a prescription, they go to the drug store, and do not always get the proper brush, and we do not have the chance of teaching them to brush the teeth properly. It is a good idea to buy the best brushes obtainable by the gross, and allow the office assistant to handle the sale of them. Incidentally, there might be added all the articles for the proper toilet of the mouth, such as floss silk, dentifrice, and mouth wash. People do not buy brushes enough. They will use them until they are worn almost to the handle. Such a brush is not only laden with germs of all kinds, but it is absolutely worse than nothing with which to brush the teeth. Such a brush is always shedding its bristles, which stick between the teeth and cause great irritation.

Dr. C. Edmund Kells was the first man to give me the idea of having "Direction Cards" for brushing the teeth, for "distribution among the patients when the brush is sold

to them." A modification of this card, as used by myself, is here shown. If we give the patient these directions orally he soon forgets, but if we give them to him on a printed card, it is impressed on his mind. (Fig. 53.)

Directions for the Proper Care of the Teeth

Upon RISING the teeth and gums should be most carefully, thoroughly, and CORRECTLY BRUSHED—using a soft grade tooth brush and.....
.....

After BREAKFAST, waxed floss silk should be passed between the teeth (be careful not to snap it down hard upon the gums, as this would injure them) or a quill tooth pick should be used—never use a wood tooth pick.

After DINNER or luncheon, when possible, waxed floss silk or a quill tooth pick should be used and the mouth most thoroughly washed with ....., if convenient—otherwise with plain water.

After SUPPER repeat the above.

Just before RETIRING, the teeth should be again thoroughly and CORRECTLY brushed with.....and the mouth thoroughly rinsed with.....

Don't brush across—brush the under teeth up and the lower teeth down—brush hard—you can not injure the teeth or gums; the gums will soon become hard, firm and healthy.

For foul breath nothing equals the pleasant odor, taste, and antiseptic qualities of ....., which should be used in good, big mouthfuls and retained as long as possible. Keep the teeth shut and alternately distend and draw in the cheeks, forcing the fluid between the teeth.

Nothing short of the above constitutes good care of the teeth.

(Tack this card above tooth brush holder).

FIG. 53. A DIRECTION CARD FORM WHICH THE AUTHOR GIVES EACH PATIENT. IN THE BLANK SPACES ARE WRITTEN THE PROPER PREPARATIONS WHICH ARE PRESCRIBED FOR THE PATIENT.

Some years ago, I had a patient, an elderly lady, for whom I did a great deal of work. When the work was finished I explained to her that, at her age, she could not expect the work to last as it should unless she brushed her teeth properly. At this time, I did not keep brushes for sale in the office, and told her to go to the drug store and purchase a certain kind of tooth brush and to brush her teeth correctly. Some months later, I received a long distance telephone message that the work had entirely given out, and that her mouth was in a terrible and painful condi-

tion. An engagement was made. On her arrival, I found that the condition was about as she had said. Of course, she had been brushing her teeth, "just as you told me, Doctor." She was rather wrathy. Arrangements were made for the patient to come next day, and bring her brush with her. The next day she returned, and I had her to brush her teeth for me. She brushed the teeth as well as I or anybody else could have done it, but, if she had been taught for a month, she could not have evaded more skilfully the very places which she needed to brush, that is, the gingival margin of the gums. This led me to the valuable idea of never saying, "brush the teeth," but rather say, "brush the gums," for if they brush the gums in a proper manner, the teeth will get a thorough brushing.

In demonstrating the brushing to the patient, there are several methods which may be employed. The one advocated and used by Dr. Edmund Kells and Dr. R. B. Adair is that of having a full artificial denture, and demonstrating to the patient by brushing this model. However, I find it more efficient to have the patient hold a hand mirror, and watch me brush his own teeth in the proper manner. A peculiar fact is, however, that, while you are brushing the patient's teeth, and trying to show him what you are doing, his eyes are over the edge of the glass or off to one side, anywhere except on the mirror. You will have to look in the glass as well as at the teeth. They will tell you, "Yes, I understand, I see," when they are not seeing at all. Be careful about this point, and make them see. When you have finished the demonstration, give them a brush, and make them go over it themselves. I sometimes have the patient hold the brush while I grasp their fingers in order to make them go through the proper manipulations.

I remember one patient, a prominent physician in an adjoining state, whom I had remain for a week, visiting my office daily, taking some six or seven lessons before he had

mastered the technique of brushing his teeth. It is a lamentable fact that so few people possess enough manual dexterity to touch all the surfaces of their teeth.

Personally, I believe in a soft grade of tooth brush, for the reason that the gums are massaged with the sides of the bristles; should this be done with a stiff bristle brush, it would do considerable damage, that is, if the patient carried out my instructions. Again, I know that a soft bristle brush is sufficient to clean and polish the surfaces of the teeth. I know that whenever I want to polish anything on my lathe, I use wheels of fine texture, and, that whenever I want to grind or cut into the surface, I use a stiff brush. In the mouth I have but one idea, and that is to clean and polish, and not injure any structure.

I demonstrated in my office to several dentists—advocates of the hard tooth brush—by cleaning the teeth of a patient in the following manner: on one side, I cleaned with a soft grade of brush, while on the other side I used a medium stiff brush. The debris was cleaned off, if anything, better on the side where the camel's hair brush was used, and, on the side where the stiff brush was used, the gums were in a bleeding condition.

Dr. Arthur Black says: "I have seen very few cases only two of which I have made definite record, in which the gum septa have been inflamed by the use of a too stiff toothbrush. In both cases, there was marked improvement promptly following the change to a softer brush."

Dr. M. H. Fletcher insisted that his patients use a hard brush, and, in addition, that the teeth be scrubbed, claiming that in addition to cleansing the teeth, the connective tissue is developed to a high degree in them. This, he says, has the same effect on the teeth and gums as the mastication of hay, twigs, and rough food has on the gums of animals. Dr. Fletcher also objected to dentifrices that contain soap, claiming that they cause the tooth brush to slip over the tar-

tar and food without removing them. On the contrary, Dr. N. S. Jenkins claims that this is the most important thing for a properly prepared dentifrice.

It is reasonable to believe that before the deposit of tartar takes place, there must be some cementing substance to hold it in place—some agglutinizing material; thus, if we fail to brush our teeth one day, this material accumulates on the teeth, and forms the beginning of calcarious deposits, with the result that from this one day's lack of brushing a rough surface is left for the beginning of an accumulation. We see how important it is to train our patients to know that an irregular system of brushing the teeth fails, and that for brushing the teeth, to be successful, it must be regular and systematic, with no skips in between. After the material has accumulated on the teeth for a few days, it is impossible for the patient to remove the deposits, and he must report to the dentist.

Dr. Francis says, "Some mouths, so far as the tooth brush is concerned, are unexplored caverns of miniature type, and, others, which receive an occasional visit from the intrusive explorer, are not in a very much better condition for the little care bestowed upon them."

Expressions as the one just cited should urge us to the utmost to bring about a change of thought in the minds of our patients toward the cleanliness of their mouths. This training of patients to brush their teeth properly is one of the hardest and most thankless things that the dentist has to do.

THE DIRECTION CARD.

In former years, before I used the printed "direction cards," much time was spent in training the patients. When at a subsequent sitting, if asked to demonstrate how they were brushing their teeth, they would do almost the oppo-

site from what had been told them. The patients often replied with the expression, "Now, that is just the way you told me."

Now, after training the patients, a card containing condensed directions for the care of their teeth is given. They are requested to preserve this card. The patients will get a better idea from seeing the suggestion in print. Then when they claim, "just as you showed me," you have all the advantage by using another direction card. All dentists should have printed some card giving their directions. It saves time, does good, and costs little.

On the direction card illustrated, note carefully the word "Correctly," and the technique which is given; if this is carried out it will remove the debris from the teeth, and give a better massage effect to the gums than any other method with which I have experimented. This results in the bristles going into the interstitial spaces.

The manner in which most people brush their teeth resembles the way in which the small boy shines his shoes on Sunday morning. He shines the tips all right, but, if left to himself, he never touches the heels. People will brush their front teeth, but they never get to the back ones.

In brushing the teeth, we should begin at some definite point, such as, for example, the upper right buccal surfaces. The brush is placed with the bristles pointing straight up, the side of the brush against the gums. A rotary tilting motion revolves the bristles, using the hand as an axis, and thus forcing the bristles between the teeth. The brush is next moved around to the front, and then the left buccal surfaces. Then, in order, brush the palatal and lingual sides of the teeth with the same position of the brush, high upon the arch, and turned outwards, bringing the bristles down between the teeth. Then the occlusal surface of the molar teeth is given careful attention.

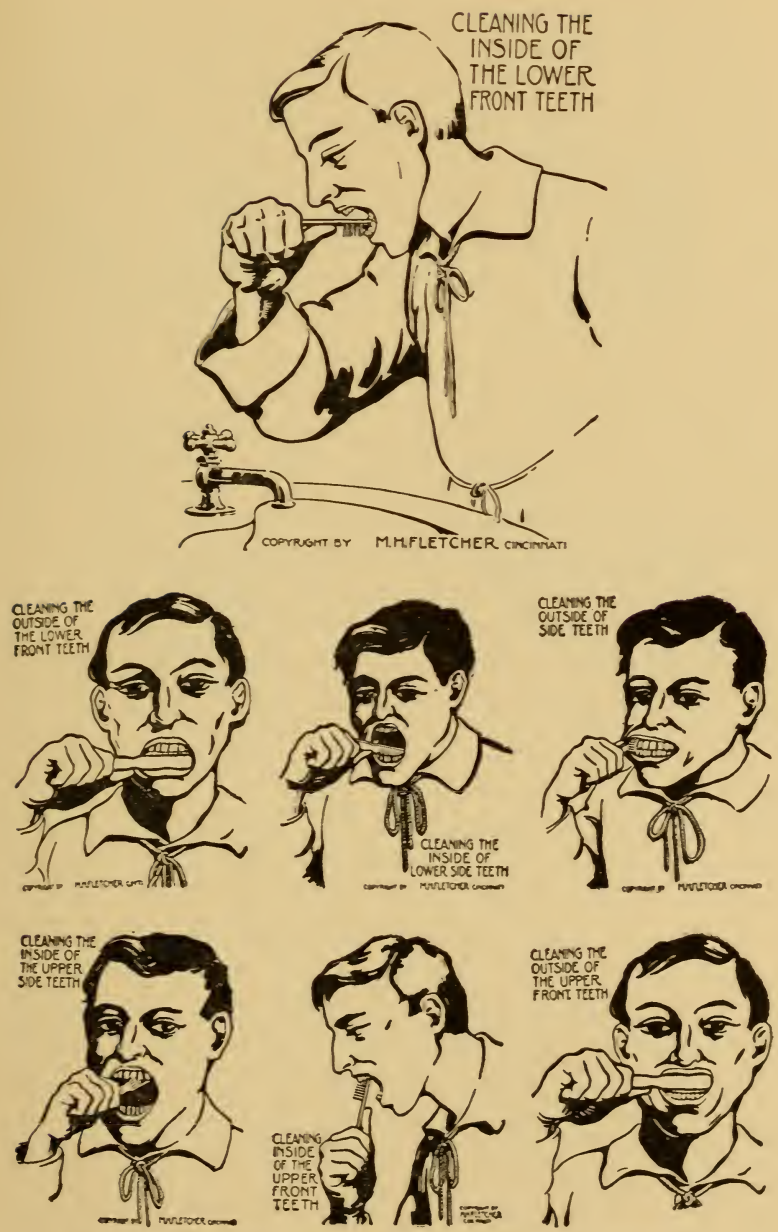


FIG. 54. SHOWING IMPORTANT TOOTH BRUSH MOVEMENTS.

Dr. Fones states that the tooth brush be made to travel as fast as the hand can be made to go, and he gives another useful point in brushing the inner surfaces of the lower teeth, which is, to have the patient hold the thumb on the top of the handle instead of around it.

The brush is now placed in the right side in just the reverse manner. On the lower jaw, it is just the reverse as on the upper. Here, the bristles point straight down, and the long side of the brush is against the gums. We now bring pressure, and rotate the brush upwards. The same technique is brought out around the circle of the teeth, but when we come to the lingual sides of the lower jaw teeth, we have to change our technique. Here, the brush has to be pressed between the tongue and the molar teeth. The molars should be brushed with an in and out movement, as the rotary movement would be of no use on account of not being able to get the brush below the gum margin. The lingual surfaces of the lower incisors is brushed by inserting the brush as far down as possible, and bringing it out with an upward movement. We must caution the patient against brushing across the cuspids for fear they will cut grooves. We mean when we say, "A clean tooth will not decay," that the pabulum on which germ life will feed has been removed, or rendered inert.

Every dentist seems to have some special shape and variety of tooth brush. The brush advocated by Dr. A. E. Peck has recently been given a personal trial by the author with the results so satisfactory that he gives an illustration of its shape and a copy of the directions which Dr. Peck says, "is a new method of cleaning the teeth with the brush which will entirely eliminate the danger of causing the gums to bleed, and in this way, the possibility of infecting the whole system."

FIG. 55. THE PECK METHOD OF BRUSHING THE TEETH.

The cross-sectional drawings show the proper positions of the brush while cleaning the outside of the lower back teeth.

Always start with the back teeth. Force the brush down between the gums and cheek until the back of the brush rests on the edge of the gums at the angle shown in Cut No. 1.

The brush should then be rotated (about ⅛ turn) to the position shown in Cut No. 2, with the sides of the bristles pressed firmly against the gums. Next raise the brush to the chewing surface of the teeth, keeping the bristles at the angle shown in Cuts No. 2 and 3. Repeat this movement until the teeth are cleaned.

To avoid injury to the gums in brushing the outside of the *front teeth,* place the brush in the back part of mouth as shown in Cut No. 1 and then draw it forward to the teeth to be cleaned, keeping the bristles well under the lip. The back of the brush should now be in the same relation to the gums of the front teeth as shown in Cut No. 1. Then finish the operation as shown by Cuts No. 2 and 3. Repeat this movement until the teeth are thoroughly cleaned.

In cleaning the *inside surfaces of the lower teeth,* start with the ends of the bristles pressed against the tongue. Finish as shown in Cuts No. 2 and 3.

To clean the *inside of the upper teeth* place the side of the bristles against the roof of the mouth and gradually rotate the brush about ⅛ turn while you are drawing it to the chewing surface.

In cleaning the inside surfaces the entire brush must always remain inside the teeth. Never let a part of the bristles come over the ends of the teeth.

THE WRONG WAY.

Never rotate the brush so the ends of the bristles rub against the gums as shown in Cut No. 4. This is liable to cause bleeding and infection from dangerous germs which may be on the ends of the bristles.

Impress them with the importance of removing all deposits of food or other material which would form a good culture ground for dangerous germs. These deposits under the margin of the gums can be removed by the patient with a properly shaped stick and an abrasive.

The Tongue Scraper, Massage Stick, and Polish will assist materially in this work. With this stick they can keep the tobacco stains from their teeth, and prevent many plaques from forming. The mother can use this stick on the teeth of the children who are too

FIG. 56. THE CARE OF THE TONGUE IS OFTEN NEGLECTED. SOME SIMPLE APPLIANCE AS ABOVE, PROPERLY USED, IS A GREAT AID TOWARDS A CLEAN MOUTH.

young to come to the dentist. She can help keep their mouths clean and healthy, and at the same time educate them to the importance of having their teeth attended to. It will familiarize them with having others work on their teeth, and when they do come to the dentist they will be much more easily handled, and better results will be obtained.

The value of the tongue scraper was recognized by the Chinese many years ago, and a jeweled tongue spoon was a part of their toilet requisites. The removal of the disintegrated mucus from between the papillae of the tongue eliminates from the body a fine culture ground for all kinds of bacteria. The tongue scraper should be used soon after rising each morning.

Dr. Paul R. Stillman is a strong advocate of the dentist taking time to teach his patients the proper method of brushing the teeth. In the following quotation is given his views on the question.

"I wish first of all to condemn the whisk-broom method, or so-called sweeping of the teeth, as taught by certain oral hygienists, who lecture before Mothers Clubs, school children, etc. It is not my intention to cast reflection on the splendid work done for oral hygiene in general by these men, but their teaching of technique on the subject of the tooth brush is both incorrect and inefficient.

"If I wished to clean the floor of a street car, I wouldn't sweep it at all. I would get a pail of hot water, soap and a scrubbing brush and I would scrub the floor of the car, and after I had scrubbed it I would rinse it clean. We see too many mouths every day that are swept, and they compare with a clean mouth about as a swept car does with a scrubbed one.

"This sweeping method of using the tooth brush was genuinely and earnestly advocated by men seeking a better way than the harmful practice that is still almost universally used by the uninstructed. I refer to the violent mesio-distal stroke similar to that used by the boot-black in his work.

"We have all observed mouths which show the pernicious effect of this habit. The method is actually harmful.

"The brushes I prescribe are always small in size. Small brushes are more efficient for they will reach surfaces that

the ordinary size can not. Usually those sold as 'child's size' for adults, but frequently in mouths of mal-occlusion I prescribe the still smaller size. In rare cases when the lower teeth incline lingually, or where certain individual teeth are out of arch alignment, the ordinary type of tooth brush is not sufficiently efficient and I supplement with a porte polisher in which small brushes may be inserted.

"Try this little experiment: Take a little flour of silex, plaster of paris or tooth powder, and rub it upon the thumb nail and well into the cuticle. Now take a tooth brush, laying the bristles flat, and with the same revolving-on-its-axis movement of the brush, as described in the whisk-broom method of sweeping the teeth, sweep the powder toward the end of the nail. You can not clean that powder from the nail in fifty sweeps. If this experience does not convince you, use a brush on the next patient's mouth, and see how impossible it is to clean the gingival border and the adjacent tooth surface with the whisk-broom technique."

THE CARE OF THE TOOTH BRUSH.

The tooth brush used by a person having a healthy mouth will show millions of organisms. If the bacterial count be made from a brush used by a person having a considerable amount of oral sepsis, we will find more micro-organisms than in common sewage.

The ordinary cleansing of the tooth brush is without effect. On the other hand, we are at a loss to know how to advise patients in regard to the proper sterilization of their brushes because any really effective agent will destroy either the bristles or the handle of the brush.

German experiments have shown that those brushes which are used in combination with some dentifrice having antiseptic properties carry a smaller number of bacteria than others.

Efforts have been made to provide a small sterilizer for individual brushes, but these, so far, have proved a failure. Some of them used formaldehyde gas which proved so disagreeable on the brush that the individual would not use it.

All-glass cases for keeping brushes become counter-infected. Brushes are kept best where fresh air and, if possible, where sunlight can get to them.

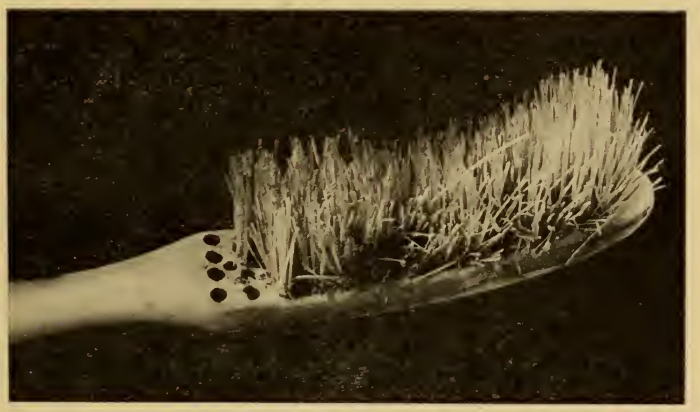


FIG. 57. Many of the dentists' best patients are using brushes like this constantly. This one was being used by a lady of the highest type. The cut fails to show the covering of scum. No matter how much talk and treatment you give the patients, if they use a brush until it gets into this shape their gums will continue to be infected. (From author's collection.)

To prevent the tooth brush from becoming a culture medium, we should first advise the patient to have regular, systematic cleansing of the mouth to keep the bacterial contents therein normal. Every time the dentist cleans a patient's teeth, the purchase of a new brush should be insisted upon. Generally, we are met with the remark: "I just bought one a week ago." The patient, not knowing the importance of this matter, will generally tell you that the brush is in good condition. The suggestion is offered that

the dentist at each cleaning furnish a new brush to the patient with his name engraved on the handle by means of a dental bur and blackened with ink. At each engagement for tooth cleaning, insist that the patient bring the brush which he has been using at home. Often, even though the cleanings have been six months apart, the same old brush will be handed you. Often only a handle is brought, sometimes filth fills the spaces between the tufts of the bristles. (Fig. 57.)

The use of the tooth brush has been looked on as one of the signs of high civilization, but of late, the bacteriologists have said so many bad things about it that unless we can keep it clean it would be better for civilized man to use other means of cleaning his teeth.

Sometimes by telling a story of the extreme side of the question, we can impress the patient much better with the thought which we wish to bring out. The following may be used to good advantage.

One patient told the dentist not to advise her husband to brush his teeth for when he went to a dentist a day or two he became so interested in his brushing that he often used her brush as he could not find his own, since he had no regular place to keep it.

A prosperous farmer brought his daughter to a dentist and, on being told the need of brushing the teeth asked the price of a good brush. "I'll take one," said the old fellow. But on being informed that he needed one for each member of his family, he made the following reply: "One is enough for all of them until I see whether it works as well as you say it does." One was all he could be persuaded to take.

Mrs. Ganung, of the Fones school, reports the following incident: "I asked one of my little patients one day if he had his tooth brush with him, whereupon he produced from his

pocket a rather hard-looking brush, well worn and far from clean. I started giving him instructions in brushing, while his brush was soaking. His conscience apparently bothered him, for he finally stammered: 'Eh! that isn't my brush, it's my uncle's, but he lets me use it!' He was given a new brush for his exclusive use upon the promise that he would keep it as his personal property."

THE PROPER USE OF THE TOOTH PICK.

Tooth picks certainly injure the gum structure, still their non-use at the proper time causes still greater harm, so all we can do is to advise and caution our patients against the resultant dangers if not properly used. Some of the most painful cases I have ever relieved were caused by points and splinters from wood tooth picks broken off between the teeth or stuck into the gum structure. Advise against the wood pick.

The small size quill tooth pick is the best to use. Before using, the sharp point should be snipped off with scissors or a piece of sandpaper.

When food is impacted between the teeth, the pick must be used to get it out, but it must not be jammed into the gums or interproximal spaces. I have heard patients say that they use a pick every day until the gums bleed. When the gums do bleed, it is a sure sign that the patient has stabbed or lacerated the gums, causing an inflammation which may develop into a Pyorrhea pocket for the further lodgment of debris and pathogenic bacteria.

The dentist may not think it his business to go into detail with his patient about such a little thing as the use of a tooth pick, yet the patients have to use them, and their abuse causes such serious results that it behooves us to give the proper instruction.

THE USE OF DENTAL FLOSS SILK.

Every article used to obtain a clean mouth is subject to abuse. We have mentioned a few due to the brush and tooth pick. Floss silk is not free from this possibility.

I would rather a patient would neglect the brushing than the use of silk, yet, one is just as important as the other. Few patients seem to possess the manual dexterity to use the floss silk properly. If the dentist be content merely to suggest to the patient that he use the silk serious injury to the gums and the peridental structure is sure to result.

The floss should not be snapped between the teeth. It should not be given a violent saw motion. It should be withdrawn buccally or lingually, as this prevents the breaking of the silk and more readily cleanses these surfaces. For those patients wearing bridgework, the dentist can furnish an instrument to thread the floss under the work. This instrument is made of small size aluminum wire, the loop end being bent about an inch, forming an eye through which the silk is threaded and carried under the bridge. The other end of the instrument can be formed into a larger loop and flattened to use as a tongue scraper. Instruct the patient to saturate the strand of floss silk with tooth paste. This cleanses better and exerts some antiseptic properties.

If the teeth are open enough for the use of flat silk, this grade is preferable for the reason that it cleanses better and more quickly, also there is less danger of injury to the soft structures.

The patient should be taught that he is using the floss silk to *remove* particles between the teeth and *not to force them under the gums.* If they will give the proper attention to what they are doing when using silk, they will soon be able to distinguish the difference in feeling when the silk is properly used.

The patient must also be instructed to return for examination when he finds that the silk cuts or breaks when used be-

tween the teeth, for this means some decay has taken place, or that calculus or some overhanging edge of filling should be looked after before the decay gets of much size, or the filling or crown be pulled out.

Dr. Grace Rogers Spalding is a great believer in the use of dental floss. To emphasize the importance of its use, she presents her patients with neatly printed cards, two of which are here illustrated. (Figs. 58 and 59.)

With Apologies to "Life"

THERE ARE BETTER THINGS TO REMEMBER THAN BRUSHING ONE'S TEETH, BUT ONLY ONE THING WORSE TO FORGET—DENTAL FLOSS.

FIG. 58. PRINTED ON BEST GRADE CARD BOARD, SIZE 5x3. (Spalding.)

FOUR REASONS FOR USING DENTAL FLOSS

1. There are 64 surfaces of a complete set of teeth which the tooth brush can not reach.

2. More cavities form on these surfaces than on any others, which can to a large extent be prevented by the intelligent and systematic use of the proper kind of dental floss for breaking up bacterial plaques, the cause of dental caries.

3. Food particles forced between the teeth undergo chemical change in a few hours at the temperature in the mouth. The dental floss can remove them completely.

4. Anyone wearing a fixed bridge needs to use dental floss to care for it properly.

Dental floss to be effective must have width so that it can be used to polish the proximal surfaces of the teeth. If by correct manipulation you can not get it between all of your teeth there is something needing attention. Improper use of the dental floss may produce injury to the soft tissues; so use it carefully and intelligently or not at all.

FIG. 59. PRINTED ON CARD, SIZE 5x3. (Spalding.)

Dr. Kells says: "I have concluded that the only way to *cleanse the teeth,* especially when there are pockets of any description, is by a flushing machine. I believe I can take any mouth after it has been flossed and brushed and work debris out of any pocket with a fine stream. No hope can be entertained that patients will use the method, but the facts stated will hold nevertheless."

For this flushing he furnishes his special patients with an outfit made from the metal point of a chip blower having about five feet of small tubing attached, the opposite end of which is fitted with a suitable cork for inserting into the water faucet of the bath-tub. (Fig. 60.)

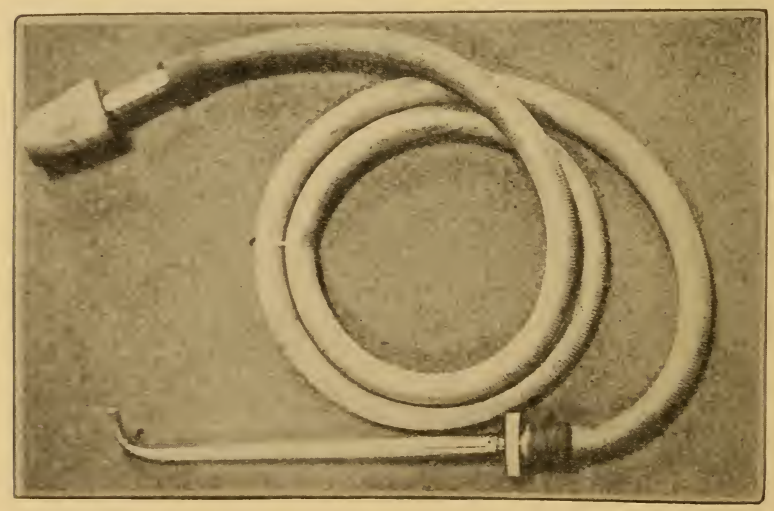


FIG. 60. DR. KELLS' IDEA OF FLUSHING THE MOUTH. MADE OF CHIP-BLOWER NOZZLE, SMALL TUBING AND CORK, END OF WHICH IS INSERTED INTO WATER FAUCET.

The author fully agrees with the idea, but believes his method is more practical and will be carried out by the patient. In cases where the patient has pockets, either of gum or bridge-work, it has been his custom to furnish a Moffett water syringe and to give instructions for its use.

THE BAD BREATH SIGNAL.

How often on the street corner, on the car, in the church pew, at the social function, and in the dental chair have we been annoyed by having to associate with those individuals who suffer from bad breath. As the possessor of the bad breath is not aware of its odor, he, consequently, does not know that he is so afflicted, and it does seem that he always wants to get up close to your face to talk. Strange to say, some of these very people carry out to the best of their ability and knowledge the ordinary rules of mouth hygiene, and yet this condition continues to exist.

This is a very delicate matter to mention, and yet, there is no one so well placed as the dentist to help in this respect. The subject of foul breath should not be discussed with these patients, for they are very sensitive on the subject. However, in a tactful manner of speech, we can train them into a more accurate system of flossing the teeth, and can suggest their taking up a system of Prophylaxis. If we do this, we can work out to our satisfaction the cure of this defect.

Dr. Geo. M. Niles, a Gastro-Intestinal specialist, has written a valuable paper on the subject of "The Bad Breath: What it Portends." Some extracts from this paper give us valuable information on this subject.

"When the personal odor is offensive, it is a great misfortune; if preventable, it is an inexcusable disgrace.

"In the ordinary intercourse between individuals, the exhaled breath generally constitutes the most noticeable odor, and it is to that phase of the subject this study is mainly directed.

"Every one of my readers can probably call to mind one or more acquaintances, who, except for an abominable breath, would be attractive; but from the presence of this handicap, are avoided, perhaps disliked.

"A busy dental surgeon, of this city, who has offices in the same building with a rectal specialist, recently informed me that, on comparing notes, they both decided that the dentist, in his daily routine, encountered more offensive and septic cavities than did the latter in his rectal work.

"The mouth, as the portal of entry for food and air, warm and moist, with numerous nooks and crannies, where stray particles of food and other debris may furnish an inviting field for countless micro-organisms, is by far the most fruitful source of bad breath. Among other causes in and adjoining the mouth, besides carious teeth, pyorrhea alveolaris, tartar, septic gums, glossitis or stomatitis, may be mentioned necrosis of the nasal bones, purulent hypertrophic or atrophic rhinitis, ozena, septic tonsilitis, or even squamous-celled carcinoma of the mouth or tongue.

"After all is said, however, it must be admitted that we occasionally see a patient in whom no adequate cause can be found, but who, nevertheless, labors under this misfortune. Though it is possible that such may be due to some lamentable personal idiosyncrasy, we should be slow to admit such a contingency. In these rare cases a persistent search will sometimes disclose a putrefying impaction in some almost inaccessible recess in the mouth, where neither tooth brush nor dentifrice can penetrate. A dentist of experience of this city, stated to me that a breath of surprising foulness could be produced by one small impaction of this sort—so small as to be discovered only after patient search.

"Successful management by the physician or dental surgeon will afford such relief from embarrassment to the patient and annoyance to friends, that well may the emancipated sufferers 'rise up and call him blessed.' "

While most cases of foul breath are due to mouth conditions of the patients, it may come in some degree from constipation or intestinal intoxication. Generally, in uncomplicated cases, the taking of some purgative medicine, as one teaspoonful of epsom salt before breakfast, for a week or ten days together with larger quantity of water, will help this condition.

LIME WATER AS A MOUTH WASH.

The number, kinds, and styles of dentifrice and mouth wash formulae are legion. It is not the intention of the writer to enter into a discussion of their relative merits, except to say that it is not so much which *brand* is used as the *way* in which it is used.

As many of our prominent dentists have become such strong advocates of the use of lime water for a mouth wash, the method of its preparation will be given.

Dr. Kells was one of the first advocates of lime water as a mouth wash. As the proper quality of lime is rather hard for the patients to secure, he keeps this put up in two-ounce bottles for supplying his patients. His idea is that if the patient uses a proprietary mouth wash in as large quantities as he prescribes, it would be too expensive for them.

Noticing that Dr. Fones, of Bridgeport, Connecticut, also recommends lime water, I asked him to give his opinion relative to the recent publication of Pickerill, who claims that all alkaline mouth washes prevent a free flow of saliva, and, as the saliva is the best mouth wash possible, the use of lime water does not have the desired effect. My personal experience was that it always left a furred feeling instead of a cleanly one.

In answer to these queries, Dr. Fones wrote me, and I quote at length:

"The reason why I am such an advocate of lime water for a mouth wash is that it is such a powerful, yet harmful, solvent for the mucilagenous accumulations around the necks of the teeth, as well as their proximal surfaces.

"Kirk has found by scientific experiments that it is one of the best solvents for plaques and gummy accretions of the teeth that has come under his observation. Its alkaline reactions does not especially enter into the subject in consideration of its merit. If you will secure the coarse lime, which is a very light cream color, and prepare it in the following manner, I am sure you will not have any furry effect in your mouth, but one of extreme cleanliness.

"Place a half cup of the unslacked lime in an empty quart bottle, and then fill with cold water. Thoroughly shake and allow the lime to settle. Pour down the sink all the water you can without losing any of the lime, as this first mixture contains the washings of the lime. Again fill with cold water and shake, and when this has settled pour off some of

the clear water in a ten or twelve ounce bottle for use at the bowl and again fill the quart bottle with cold water, shake and set aside for future use. This operation may be repeated until five or six quarts of the mouth wash has been used. If the lime water is a trifle strong at the start, dilute that in the small bottle with water. After rinsing the mouth with the lime water (and the rinsing should be of sufficient length of time to thoroughly foam it), rinse the mouth with clear warm water. I have yet to find anything to beat it."

CHAPTER X.

CLEANING THE TEETH.

SKILL REQUIRED FOR THE WORK.—THE BEST TIME TO CLEAN THE PATIENT'S TEETH.—THE USE OF A DISCLOSING SOLUTION.—INSTRUMENTS USED FOR CLEANING THE TEETH.—ABRASIVE MIXTURES USED IN CLEANING THE TEETH.

Under the term, "Cleaning the Teeth," will be described the operative measures employed at the dental chair for removing deposits, bacterial plaques, and stains from the average mouth. This term does not give sufficient dignity to the work and all investigators who work along this line will be glad for a better term. None has been forthcoming and, as all our patients know what we mean when we use this term, it is one which we will more often be forced to use with them. If our clientele understand "Removing Infection," or "Prophylaxis," then these terms may be employed.

It seems rather a strange coincidence that a few years ago the dentist who "cleaned teeth" was in danger of losing his club and social standing, but within the last few years the importance of this procedure has so impressed itself upon the patients that the man who does not clean the teeth of his patients, or have it done, is looked upon as a dentist who neglects his legitimate duty to his patients. There was a time when our profession would put in beautiful fillings and send the patients away with a clean bill of health although the free margin of the gums exhibited rings of calcareous deposits. It was not many years ago that the patient would not pay, or rather was not required to pay,

more than from one to three dollars for this operative procedure. Many of the laity were accustomed to having, as the Indians express it, the cleaning put in as "potlash," that is, where any work was done, the cleaning was added free of charge. In view of this state of affairs it is not to be wondered at that there was so little cleaning of the teeth done by the dentists. It was also a deplorable fact that our colleges paid little heed to this subject and many graduates, during their college days, never saw a mouth properly cleaned up by their professor or demonstrator. If the college did any of this work it was relegated to the freshmen.

SKILL REQUIRED FOR THIS WORK.

From the belief that any one can clean a set of teeth we are now learning that this operation requires most expert ability and thorough knowledge of anatomical landmarks, as well as medical treatment for pathological conditions. Generally the placing of fillings is mere routine work but the more teeth we clean, and the more mouths we put in a healthy condition, the more we realize that greater skill is required here than in any other line of work which we do. We have learned that the average patient can not maintain *clean teeth*, and that he will be compelled to have our professional assistance along this line. We have also learned that this work is of immense value to the patients, and that it is worthy of a reasonable compensation which will enable us to pay more attention to the matter.

To secure a clean set of teeth—one that would be so considered by a specialist in prophylaxis—is one of the most difficult procedures in dentistry. It behooves us to put just as much time on this work as practicable, or, in the event the patient is one who will appreciate this service, as much time should be given him as would accomplish the proper cleansing of the teeth.

THE BEST TIME TO CLEAN THE PATIENT'S TEETH.

A surgeon would not dare perform any operation without first making some attempts at cleaning and sterilizing the field of operation, but the dental surgeons absolutely ignore these rules of surgical procedure. I do not think that any dental operation should be undertaken until the teeth have first been properly cleaned. This should be done as routine work. There are many advantages resultant from this procedure. In the first place, it puts the cleaning operation on a higher plane than if it were done when the regular dental work is finished. In the second place, it enables us to bring forward the salient points of oral hygiene to the patients. In the third place, it protects the dentist from any infection, should any of these germs be absorbed through a break of the skin in his hands. In the fourth place, it prevents him from having the possible infection of hay fever, la grippe, and tuberculosis, for, if the mouth be properly cleaned out, the danger of infection from this source will be reduced to a minimum. In the fifth place, there is no doubt in my mind that if the mouth is properly cleaned out before the work is done, crowns and bridges will stay and last longer. There are many other reasons that I could enumerate, but these are enough to impress the matter on the mind of the dentist. Again, I would like to repeat, "Clean or have cleaned every set of teeth before you operate."

Right here comes the question, "Who shall do this work?" Some of us have dental nurses in our offices, and to them is intrusted this work. I have seen better work done along this line by them than by many dentists. If you can train an assistant to do this work, well and good.

The methods employed in cleaning the teeth are many and varied. Whatever method is employed, let us be sure that the patient's gums and lips are not torn up with the instruments or the floss silk. All of us have seen patients

with their mouths so sore that they could not brush their teeth for a day or two, or even chew their food properly, following the simple operation of cleaning. There is no need for any great physical force to be exerted in the operation.

THE USE OF A DISCLOSING SOLUTION.

In beginning, it is well to spray the mouth with a solution containing aromatic spirits of ammonia, diluted three times with water. This removes the viscosity of the saliva, and removes all decomposed particles of food. It is a strong cleanser, and has a pleasant effect. We now paint the teeth with some staining solution, the best of which is Skinners' Disclosing Solution.

FORMULA FOR 1 OZ. DISCLOSING SOLUTION.

Iodine (crystals)	grs. 50
Potassium Iodide	grs. 15
Zinc Iodide	grs. 15
Glycerin	drs. 4
Aqua	drs. 4

Mix. Sig. paint teeth (one or two at a time) and rinse immediately with water.

Put up in glass stopper bottle.

In making it, put the iodine, zinc, and potassium iodide into a mortar with five or ten drops of glycerin. Grind to a thick syrup, and then pour all you can into the bottle. Pour the remaining glycerin into the mortar, and stir with a pestile. Pour out again, then add water, and stir again. In this way you can get all the solids out of the mortar, whereas if the solids and liquids were all put in at once, some of the iodine would stick to the mortar, and an inferior staining solution would be the result. This solution shows up the bacterial plaques and aids in removing them.

INSTRUMENTS USED FOR CLEANING TEETH.

There are many and varied instruments on the market for removing calculus, and with most of them you can obtain good results. It is a question of personal equasion. I would caution you to select, and use the smaller instruments. Many colleges have on their required instrument list scalers which suggest plows rather than dental instruments. The writer has for years been an advocate of the Good-Younger instruments for this work, for the reason that they can be used either "push" or "pull," and, being small and rounded on the back, do not injure the tissue; there are rights and lefts and can be used in a double ended handle, simplifying operating a great deal.

The students should be taught that pyorrhea work is on the same principle as cleaning the teeth, and, if they hope to operate for pyorrhea, they must become adept in cleaning teeth. With this thought in view, let me urge that much care be taken in the use of whatever instruments are selected for this work.

It takes a separate set of instruments for this work, and for the pyorrhea work, for here we do not wish the instruments to be sharp. It is advisable to round off the sharp edges of the set intended for cleaning the teeth. Much injury can be done to the peridental membrance if its attachment is separated at the gingival border. Use a chip blower, or a strong current from the compressed air syringe, and blow at the gingival margin, thus forcing the margin of the gums away. This enables the operator to see the small patches of infection or deposit which have been previously stained by the solution. The assistant can so manipulate the air syringe as to be of great aid to the operating dentist. Now, as in pyorrhea work, to be skillful, one must brace his fingers on the teeth, so that no slip of the instrument can occur. The small blade of an instrument should be run completely around the free margin of the gums, for

we have found this to be the starting point of many pathological conditions of the gums. It does no more harm to carefully clean out this free margin than it does to clean out the finger nails. In fact, one of the tests that I make of new instruments is to run them under my thumb nail, and, if it cleans the cuticle there without injury, it will do to use under the free margin of the gum.

After the instrumentation has been done, the next procedure is the use of waxed dental floss silk between the teeth. The usual round dental floss will not give the desired results. You must have a flat floss to do the work properly. It must also be as large as can be forced between the teeth. On this floss we use an abrasive consistent with the amount of infection which is to be removed. If the spaces between the teeth are large, and considerable debris is to be removed, then we may use an abrasive containing flour of pumice. On the other hand, if the patient's mouth is in fairly good condition, we need not use such an abrasive powder, but use a chalk mixture or one of the formulas which I am giving at the end of this chapter. There is one caution to be borne in mind, and that is, in using large size silk place the thread between the teeth and then place on whatever abrasive is to be used. If we placed the abrasive between the teeth, and then attempt to pass the silk, we would find it almost impossible to do so, and, even if it did go, one half of the floss silk would be cut in two.

It is not necessary to saw the gums or the cheek with the silk, nor is it necessary to fill the mouth with the abrasive material. The smallest amount is all that is necessary. The silk should be passed thoroughly between all the teeth and threaded under whatever bridges the patient may wear. When this is done, the patient's mouth must be thoroughly rinsed out with a syringe, or sprayed with compressed air, and then some mild antiseptic mouth wash used.

We are now ready to cleanse the bodies or the crowns of the teeth. If you have the skill, and the time, there is no better method than the orange wood stick and dry pumice flour, but, while this is the ideal method in prophylaxis, for the simple cleansing of the teeth, most of us will use the dental engine. There are many and varied devices at our command for use on the engine in our hand piece. Possibly, you have adopted the bristle brush as being the most efficient; nothing has yet been found equal to the brush wheel for polishing. We should have one right angle hand piece set aside for this work. Surely, everybody has an old right angle that can be dedicated to this work. I have never been able to do this class of work with a straight angle hand piece, and any one who has used a right angle for cleaning teeth with a bristle brush, will never use a straight one again. Formerly, I had a great deal of trouble with my right angle in this work, because of the abrasive getting into it, but now I use the Consolidated Dental Mfg. Co.'s right angle, which completely closes at the back, and by inserting a rubber cup on backwards, I can keep the abrasive out of the mechanism (Fig. 61.) Needless to say, a fresh brush is furnished to every patient. However, I can see no objection to these brushes being saved, and, at the end of the week, being cleansed by boiling for fifteen or twenty minutes, and used in future operations.

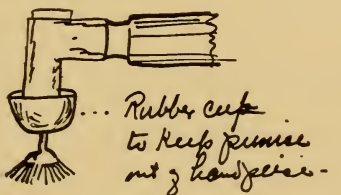


FIG. 61.

These inverted bristles can be had in a stiff grade, which are black, and in a soft grade, which are white, also in camel's hair brushes. The unmounted kind are the ones

used in right angle hand piece, using the shortest right angle mandrel.

With the sharpened orange wood stick, place the abrasive around the teeth, and with the dental engine running at a low rate of speed, carefully go over all surfaces of the teeth giving the hand piece a motion from the gum toward the cutting or grinding surface of the teeth. The mouth is again washed out, and the staining solution applies as at first. If there is any debris, bacterial plaques, or calculus still remaining, this staining solution will immediately show them up.

Now comes one of the most important parts of the operation—the careful removal from under the free margin of the gums all trace of the abrasive that has been used. It takes force to remove this material, and calls for the highest pressure which we can put on the air or water syringe. We must bear in mind that this abrasive has sharp edges, and, if left under the gum margin, may cause irritation or pyorrheal conditions. The mouth should then be rinsed out with cold water, and, as a finishing touch, I advise that some lotion as Holmes' Fragrant Frostilla be applied to the lips, which have necessarily had much unpleasant stretching. When this technique is carried out, and the proper dental toilet explained, the patient is delighted and is usually willing to pay liberally for the services rendered.

ABRASIVE MIXTURES USED IN CLEANING THE TEETH.

Ordinary powdered pumice can be mixed with either tincture iodine, alcohol, or peroxide of hydrogen. The iodine stains, the alcohol is the best antiseptic, while the peroxide is good to remove green stains.

To a teaspoonful of pumice can be added about ten drops of aromatic sulphuric acid. This is splendid for tobacco stains.

The above should only be used where the teeth are in a bad condition.

Flour of pumice is much finer, and should be substituted for the regular pumice, if possible. It can be mixed with any of the above drugs.

If the teeth are in a fair condition, it is best to take a teaspoonful of any good dentifrice or tooth paste, and incorporate with it a small quantity of flour of pumice.

Any of the above can be used either with dental engine or hand cleaning with porte polisher.

PART II.

PRACTICAL ORAL PROPHYLAXIS.

CHAPTER XI.

ORAL PROPHYLAXIS.

DEFINITION AND VIEWS OF SMITH, SPALDING, FLETCHER, FONES, THORPE, TAYLOR, RHEIN AND HARPER.

It was some years ago at a meeting of the National Dental Association, in Washington, that I first heard anything definite on oral prophylaxis, and became interested in this subject. At this time it was my pleasure to listen to a paper read by Dr. D. D. Smith, of Philadelphia, and, a few days afterwards, to meet him personally in his office. This meeting changed my entire method of conducting practice, and led me into the channels of prophylaxis. While it is true that this subject of oral hygiene, prophylactic treatment and prophylaxis has been brought up in various meetings, there is no doubt that Dr. Smith was the first dentist to advocate a *systematic treatment* along this line. His first paper was read October 18th, 1898. According to his own statement, this paper excited no interest among the dentists themselves. Some years later, by inviting dentists to visit his office, and exhibiting a large number of patients to whom he had been giving this treatment, he convinced many of the leaders of the profession that this was really a new departure. It was interesting to note, that while many were interested, and went home to put the idea into practice, many criticised him severely. A dental college professor said that it was a great craze. Many said that it would polish away the enamel. Some said that a tooth held against a brush wheel was in time worn away, and that this would be the way with teeth under prophylactic treatment.

Dr. Smith's plan of frequent treatment was based on the fact that tooth decay begins at a vulnerable point on the outside and proceeds inward along the tubuli. It mattered not to him whether this disease was caused by lactic acid. He contended that the decay of teeth depended upon our care exercised over environmental conditions. To him the place of decay or the resting place of the bacterial plaques was to be forcibly removed. This being done, we have changed the tooth conditions from bad to good, and have removed the means by which decay and disease gain a foothold.

In answer to the question, "What is Prophylaxis Treatment?" there can be no better answer than that written by the originator of this systematic treatment.

"The treatment consists of enforced radical and systematic change of environment of the teeth and perfect sanitation for all organs of the mouth. Experience having demonstrated that the most careful and painstaking are unable, with the agents commonly employed—as the tooth brush and dentifrice, tooth pick and dental floss, soaps, so-called germicidal washes or other agencies—to effect this end, the plan of forcible, frequently renewed sanitation by an experienced operator has been found indispensable. In detail, oral prophylaxis consists of most careful and complete removal of all concretions, calcic deposits, semisolids, bacterial plaques and inspissated secretions and excretions which gather on the surface of the teeth, between them, or at the gum margins; this operation should be followed by thorough polishing of all tooth surfaces by hand methods (power polishers should never be used), not alone the more exposed labial and buccal surfaces, but the lingual, palatal and proximal surfaces as well, using for this purpose orange wood points in suitable holders, charged with finely-ground pumice stone as a polishing material. Treated in this manner the teeth are placed in the most favorable condition to prevent and

repel septic accumulations and deposits, and not less to aid all efforts of the patient in the direction of cleanliness and sanitation."

To my idea nothing short of the above meets the requirements of prophylaxis.

Dr. E. B. Spalding in a paper before the Michigan Dental Society said:

"One, two or three treatments does not constitute prophylaxis. It is the constant watching, guarding and maintaining the mouth in a condition of health which constitutes oral prophylaxis."

Another definition by Dr. M. H. Fletcher is as follows:

"The name *prophylaxis* means preventive as you know, and is the work that should be done by the patient in cleansing the mouth. When a surgeon removes a foreign body from the eye or treats a wound in any manner he calls it by its proper name, viz., surgical treatment. When a dentist treats the disease of the mouth, he is not doing preventive work, but surgical work, just as any other surgeon does, and I think the dental profession should rise to the occasion, and prove to the medical world as well as to the laity that they are scientific men. This can only be done by using the proper terms to describe the locations and pathology. This will indicate that they know what they are doing."

Dr. Fones calls prophylaxis, "the ideal service to the patient."

Dr. B. Lee Thorpe, in a paper on Prophylaxis, has well said: "No treatment, internal or local, has yet been discovered as a panacea for the removal of oral accumulations or for the cure of mouth diseases. The surgical removal, only, of deposits, brushing, polishing and massage, both by the dental surgeon at stated intervals and later by the patient daily is the only known method—the dental surgeon's real duty is not to see how many teeth he can fill, but how many he can save from decay—but his responsibility is not fully

discharged until he has educated the patient to devote the necessary personal attention to maintaining a healthy condition after it has been re-established."

In as much as the terms *oral hygiene, prophylactic treatment,* and *prophylaxis* have caused so much misunderstanding, it is not to be wondered at that this work has not found its way into the general routine of more dental offices. Granting that all we have said about oral hygiene, even if this is practiced to the fullest extent, it still remains that we must imbibe some of the spirit and intent of prophylaxis to carry out the treatment as it should be carried out. It is a lamentable fact that so few dentists in the United States do this work in a systematic way. In 1911, I made a tour of most of the large cities of the United States, and, after hearing numerous papers, seeing exhibits at societies, and reading a mass of magazine articles on this subject, I realized that little had been done in the carrying out of systematic work along this line, and few had imbibed the true spirit of preventive dentistry. On June 21, 1911, I read a paper before the Florida State Dental Society upon the subject, "Introduction of Oral Hygiene into a Dental Practice." In this paper I gave some interesting correspondence contributing to the historical data of the subject of oral prophylaxis. This paper was published in the *Dental Summary* in December, 1911. I quote at length:

"Several years ago the dental profession was confronted by the fact that one of its members, a competent dentist, a social favorite, a refined and cultured gentleman, had been blacklisted from membership in a swell social club for no other reason than he 'cleaned teeth.' Nor was this stigma on prophylaxis confined to the laity. Dentists seemed to think it beneath their dignity to clean teeth, and, if it must be done, it was relegated to the assistant. Others tell us that it takes a crank to work prophylaxis. Dr. Levi C. Taylor, of Hartford, wrote me on February 7, 1905: 'I find

upon investigation that it (prophylactic) means a medicine or medical treatment, the word being very old in this connection.' Dr. M. L. Rhein took exception to this, and claimed it to be a word taken from the name of a tooth brush in 1882. Prophylaxis came into use in the sixties, and was defined by Donaldson, in 1874, very much as I defined it at your meeting, 'Surgical or manipulative treatment for the preservation of teeth. That both are a treatment no one will deny, but I do believe that each has a distinct meaning. Men and women both belong to the human family, but who would think of using the words interchangeably as meaning one and the same thing?'

"Dr. M. L. Rhein wrote me a letter in June, 1905, in which he said, 'I don't believe it makes any difference whether you use the word as an adjective or a noun; what I said in Washington, was that I was the first person to introduce the word into dental nomenclature when I introduced the prophylactic brush in 1883, and, having first made use of the word in that sense, I thought its very use, by virtue of priority, entitled it to be used in this way.'

"Dr. D. D. Smith wrote me on June 10, 1905, as follows: 'Dr. Rhein is entitled to no credit for original work in this matter. He never heard of it or thought of it until I published my paper in 1898. *Prophylactic* refers to a remedy and should be used adjectively. The word prophylaxis is never used as an adjective but as a noun, the name of a process. *Prophylaxis* is not a preventive remedy, but a preventive process. You will find these terms used interchangeably in the dental nurse paper, and without any discrimination.'

"On June 18, 1905, Dr. Rhein again wrote me: 'Not one patient out of five hundred would understand your purport, although they may declare they do. I find it necessary to impress these truths upon them again and again to make them understand. I don't care a rap about what I call this

treatment to my patients. I believe that what they can understand most plainly is the term to use, therefore, I never say prophylactic treatment or prophylaxis to them. Plain English is the best thing to use at all times with a layman. Therefore, I tell them that the cleaning and polishing of their teeth, and massaging of their gums, done frequently, is the best preventive treatment that we have in dentistry. It is all very well to use these words professionally, but plain English is the best thing for our patients.'

"Dr. Taylor, in discussing the name, says: 'Dr. Harper suggested that *prophylactic* was a noun derived from the Latin. So far he is right, but he does not go far enough. It is both a noun and an adjective, and has been applied to medicine for more than two hundred years. What does *prophylaxis* mean? It is of Greek origin, derived from a verb that means to stand guard before. There should be a distinct meaning to our words, and *prophylaxis* I would define as the surgical and manipulative treatment for the preservation of health, and many physicians, with Webster, define *prophylactic* as a noun and an adjective, meaning a medicine which preserves or defends against disease, and the same definition is given in the Standard Dictionary. *Prophylaxis* is a noun, meaning the art of guarding against, preventing disease, observance of the rules necessary to preserve health, preventive treatment. I believe the essayist intended to convey to us the meaning of what I would term *Prophylaxis,* the surgical or manipulative treatment for the preservation of health, and not the rinsing of the mouth from time to time with medicine in the expectation of establishing the health of the mouth. I criticised his use of the term, as I believe he means *prophylaxis* when he says *prophylactic.*'

"Dr. Harper says, '*Prophylaxis* is derived from the Greek; I did not say it came from the Latin, I said distinctly that *ic, al,* and *ary* are Latin suffixes, and that *pro-*

phylactic is the adjective form which means pertaining to, belonging to, or consisting of prophylaxis. Take the word *atmospheric,* which means pertaining to the atmosphere. You use the adjective form with the *ic* suffix, because you indicate something that pertains to atmosphere; also *hygienic,* as relating to hygiene. The word *prophylactic* is the adjective form which is used in referring to the noun *prophylaxis. Prophylaxis* is strictly the adjective form with the *ic* termination. At most, even if used as a noun, as in calling certain medicines or washes *prophylactics,* it is still, strictly speaking, an adjective qualifying the medicine or wash as to its uses and purposes, and referring to *prophylaxis.'*

"Leaving each individual to take his choice between these opposite opinions, and omitting any and all special methods of treatment, I shall at once introduce my subject by the statement which I believe will be generally accepted, that nearly all our dental operations are necessitated by unclean and infected mouths. Then is it not strange that we, as dentists, have failed to keep those mouths clean? Is it not strange that we have treated this abscess, filled this tooth, operated for disease of the gums, but still think it beneath us to clean the mouth and keep it thus so as to prevent these operations? I know there are many here who will say that they have practiced *cleaning* all their professional lives and that these things will happen anyway. But the fact remains that a thorough search has been made of all available dental literature, and no mention of systematic prophylactic treatment was made up to 1898. About this year two prominent dentists began to investigate those infected mouths, and to publish their views and results. Still few dentists took up the work. In public exhibitions the actual results were shown by submitting patients who had been under prophylactic treatment. Some were enthused and wrote of what they saw, but so little progress was made that the originators

nearly gave up hope, and, as one of them expressed it, 'went home tired, despondent, and with the feeling that he had done his best, and, that as the dental profession had repudiated his work, he would make no further effort.'

"But they kept at it, and evolved a system of prophylaxis founded on correct etiologic principles. The results accomplished have forced us to realize the wonderful development there is in store along this line, and we now see the dental journals teeming with some new phase in every issue.

"In the past, our work has been the repair of diseased tissues; our studies in etiology yielded no practical results. Dentists of the future must study and practice etiology and prevention. Until our present views on oral prophylaxis were accepted and understood, etiology was the subject about which dental authors wrote volumes and spun theories that now seem ridiculous when we meet them in reading.

"Detail would make this paper too long, and I shall confine myself to facts which have been well established.

"1st, That the etiology of the larger per cent. of dental operations is traceable to local infection.

"2d, That tooth decay is from without, and caused by constant contact with infectious material.

"3d, That simple gingivitis, Riggs Disease, and enlarged glands, are rarely traceable to constitutional causes, as urema, or syphillis, but generally to an infected mouth.

"If you accept these well-established truths, I can expect your interest in the remaining part of this discussion. The medical profession has just emerged from a transformation of its methods from *all treatment to prevention and sanitation.* For instance, instead of giving all their time to the treatment of malaria, medical men now turn to the cause, and, by sanitary measures, seek the death of mosquitoes. The up-to-date physician now watches the surroundings of his patients to prevent typhoid fever. He takes all precautions to prevent small-pox, scarlet fever, and diphtheria. 'To

cure is the voice of the past, to prevent is the Divine whisper of to-day.'

"Dr. M. L. Rhein, of New York, and Dr. D. D. Smith, of Philadelphia, both believe alike that this is the most important part of a dentist's work, but they have differed decidedly as to how to put the work into execution. Dr. Rhein claims that all patients should be given the benefit of prophylaxis, but that if he did the work himself, he would have little time for anything else. The charge for the treatment would be a burden, for the patient to pay at the rate of $5.00 to $15.00 per hour for twelve treatments each year. He contends that the work is not so difficult, but that an assistant can soon learn to do it, and he has introduced to us the dental nurse, whose duty it is to perform this work for patients at a nominal charge. Dr. Smith, on the other hand, won't agree to any of Dr. Rhein's ideas, and contends that prophylaxis is the most difficult thing that the dentist can be called upon to perform. Inasmuch as it is the best thing that a dentist can do for his patients, and takes a great amount of skill, the patients should not go into the hands of an assistant, but that he must do the work himself and charge accordingly."

CHAPTER XII.

WHY IS PROPHYLAXIS NECESSARY?

WHEN TO BEGIN PROPHYLAXIS.—FREQUENCY OF TREATMENT.—OBJECT OF PROPHYLAXIS.

One question which will frequently be asked us is, "Why is prophylaxis necessary to-day when all these years up to the present time cleaning the teeth once a year was thought to be all that was necessary?"

If you will go back a few generations, you will find conditions very different from those of the present day. In the first place, even those who lived in the cities lived more of an outdoor life. The strenuous life of the modern business man was then unknown. The time for a meal was of much longer duration. In addition to this, the culinary art had not reached its present high state of development. Cooks in our time seem to have for their chief object the preparation of foods for absorption through the intestines, and to dispense, as it were, with the duties of the stomach. They seem also to strive to prepare the food in as sticky a manner as possible. In this day and time, if food were put on the table which would require a proper amount of mastication we would think that something was surely wrong, our cook would think it an insult to our table and that such food should be run through the meat chopper. It is a rare opportunity when one of us makes a meal of such food that the teeth get to perform their real duties, that is, tearing, rending, and grinding.

The interproximal spaces in our mouths which were intended to be closed up, are now wide open to receive this sticky food. While we have this sticky mass adhering to the

surfaces of the teeth it constitutes the best culture medium for the growth of the numerous bacteria which are always in the mouth.

Disuse of any organ or of any part of the body results in the atrophy of that part. Take, for example, the wide alveolar process with teeth embedded in thick peridental membrane that our forefathers had. They were capable of much greater chewing power than are the teeth of our present day with the thin peridental membrane surrounding them. And then we have that modern abnormality—the narrow arches and irregular teeth—making it necessary to carry out the most careful oral hygiene in order to keep the teeth free from sticky, doughy, tenacious foods. Also the teeth in our present day are submitted to various deleterious influences in the way of food and drink condiments which are strong enough to etch a marble slab, and these are followed by an ice cold drink or steaming cup of coffee. Thus we see that cleaning the teeth was not so necessary with our forefathers as it is with us on account of the high degree of civilization, with its consequent dental degeneracy, to which we have attained. We might say that modern prophylaxis is to counteract this self-occasioned loss. In other words, we have to do by cleaning the teeth and prophylaxis what used to be done by nature. The great number of tooth manufacturing houses throughout the land points to the necessity of finding some way by which this great loss of such important organs as the teeth can be checked.

The medical profession has for years advanced along the lines of preventive or prophylactic treatment. The prevention of small-pox has been insured by vaccination. We have recognized the fact that the best work of our medical men is along the lines of sanitation. We have welcomed the preventive measures in our army for the checking of malaria and typhoid fever, and while all these are being constantly brought before our eyes, dentists not quick to accept the

simple truths which are continually in their sight, are still making crowns, fillings, and bridges for these broken down teeth and are not recognizing that the crown of these teeth is not so important as the root, and the peridental membrane surrounding it. When we realize the nature and cause of all these diseased conditions, and when a system of preventing it is at our hands, the neglect seems criminal.

This thought is well expressed by Nodine, who says:

"If the field in which dentistry works is as great as we are taught that it is; if clean mouths, and sound teeth mean as much as we read that they do; if the achievements and technical skill accomplish the results that we know they do; if the world needs dentistry as much as we believe that it does—then we fail ignominiously in our obligation to society when we don't tell it the importance, the significance, the accomplishments and the needs of dentistry."

Talks with parents in the dental office are not always given under favorable conditions and have not produced the proper results. Below is copy of a circular which a prominent dentist sends out several times a year with his bills to those having children under his care. Follow his example and spread these important facts.

CARE OF CHILDREN'S TEETH.

The proper care of children's teeth is of the utmost importance, and while it is a fact that the temporary teeth will be lost, it is nevertheless true that their neglect may bring about more serious results than the same neglect of the permanent teeth.

As soon as the first tooth is well erupted the use of the mouth rag should be supplemented by that of a soft brush, and with this and clear water the teeth should be carefully brushed every day.

Immediately upon their full eruption, the surfaces which are in contact with each other should be polished daily by means of suitable floss silk.

When the child has reached an age at which it will not swallow everything that is put into its mouth, precipitated chalk should be used upon the brush once a day.

If the teeth were perfectly formed when erupted, this care should keep them in perfect condition, provided always that the proper diet has been insisted upon.

Little children should not be allowed to eat candy or other sweets. If there is any agent which will ruin infant's teeth more quickly and more seriously than condensed milk, it is not known to the writer.

Unless there is evidence of such necessity, the child need not be taken to the dentist until it is two years and a half old. At that age the teeth should be carefully examined by him, and again every three or four months.

However, if at any time dark stains accumulate upon the teeth near the margin of the gums they should be polished off. It is absolutely essential that all surfaces be kept clean and bright.

The decay of these temporary teeth insures the child untold discomfort and pain, and usually interferes with the proper eruption of the second set. Owing to their nature it is most essential that all cavities should be filled in their incipiency.

The extraction of any temporary teeth before the period for the eruption of their permanent successors usually interferes with the proper eruption of the second set.

The first teeth of the permanent set to appear are the first molars, which should erupt at about six years of age and before any of the first set have been lost. These teeth should be kept under a watchful eye as they are very prone to decay.

If at this age the arches have not grown, and all the front teeth so separated that one or two thicknesses of blotting paper can be put between them, the second set are sure to be crowded and irregular—in such cases the arches should be expanded and the necessary space made to accommodate the larger teeth of the second set.

While some children may contract unfortunate habits notwithstanding the most strenuous efforts being made to prevent their doing so, the permitting of a child to suck its thumb or fingers, or the giving it a "pacifier" is simply criminal, as most serious results must follow.

The harmfulness of mouth breathing should be recognized and the necessary steps taken to cure it.

During the eruption of the second teeth they should be given special care and should be examined at least twice a year and cleaned and polished as often as necessary. Cavities should be filled in their incipiency.

If the family dentist were charged with the duty of sending for the child at stated intervals, the chances of neglect upon the part of the parent would be minimized.

Eternal vigilance is the price of good teeth in the child as well as the adult.

C. EDMUND KELLS, JR.

WHEN TO BEGIN PROPHYLAXIS.

Our patients seem to think that decay in children's teeth is just a normal condition, for how often will a parent when told of the decay in a molar tooth say, "O that is only a temporary tooth," and seem no more to mind it than they would a bump on the face, when we know that the decay is serious because of its bearing on the future condition of the child's teeth.

In the first part of the book we have learned the startling facts of what accumulation on the teeth leads to, and the logical reason why a systematic removal should be insti-

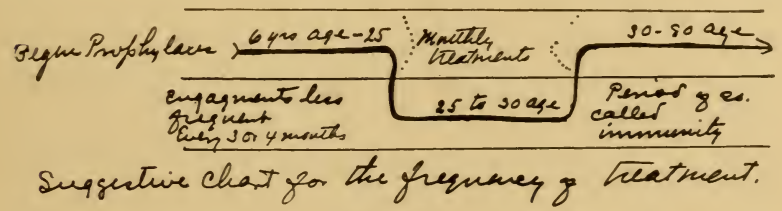


FIG. 62.

tuted. Dentists should be willing to give more of their time to this work.

The necessity for and frequency of prophylaxis may be illustrated by what I term the Age Curve (Fig. 62). What is meant is, that children at the age of six years should be placed upon a regular and systematic prophylactic treatment for it is here that the care of the dentist is most needed. In my practice I have been astonished at the needless loss of sixth year molars. It is for this reason that I say the most important time for prophylaxis is with children at the age of six years, for at this time we can have better control over the patients, and suggest to them habits which will lead them into proper hygienic rules. We can thus have the opportunity, at the proper time, of extracting the temporary teeth so that the permanent teeth will erupt at the proper places. This will save the parents much orthodontic expense and save these teeth from the very start. At this time the children learn the proper oral hygiene and dental toilet habits; later, as they are having to go to school or to work there will not be a good opportunity to get these ideas instilled into their minds. From the age of twenty-five to thirty there is a period of comparative immunity and I would not think that such frequent prophylaxis treatment should be necessary. After this time some of the work that was done in former years begins to fail and the rush of business and social life makes great demands on the vitality, so that more frequent treatments will probably be necessary. From thirty-five to old age, more stress should be laid on prophylaxis.

In children the main thing we have to combat is dental caries. I have heard many dentists tell children that meat eating is the cause of these decays. If Prof. Miller's experiments are correct, he has proved that meat eating is not the cause of such decays. I believe that we should encourage the children to eat meat, and, what is more important,

to leave off sticky foods. On the other hand, it is just as true that as the child grows older, these remains of meat left between the teeth become more dangerous on account of their tendency to cause pyorrhea. From twenty-five on, we are not looking so much to have to prevent caries, for as we have said, there seems to be a form of immunity to caries at this time, but the greatest trouble will come from some infection or disease of the peridental membrane, and we must look with all care towards saving this membrane in its integrity. Meat impactions and decomposition cause much distress and disease of the gum margin. The reason for this is that as the patient grows older (as in all other parts of the body) the alveolar process begins to undergo a senile change. In the first place the animal matter becomes less, the bone begins to solidify, and the blood vessels get smaller. The haversian canals can hardly be found. These changes give food debris a greater opportunity to irritate and infect the gums.

It was once argued by some of the medical profession that the dentists did a great wrong when they tried to preserve a man's teeth after he had passed the age of fifty, for, said the essayist on the subject, "It is nature's plan to lessen the amount of food for the senile stomach." They claimed that if the dentists kept the teeth of the old people up to the standard that this would enable them to eat as when young, and that many of the ills to which old people were subject were caused solely by their ability to carry on active mastication. Dentists, and especially those engaged in prophylaxis, now stand ready to refute this from every point. Of course, if the patient is one who has a very septic mouth, has bridge work which will not be kept clean, and toxins are generated around this the medical man has some justification for his belief that the patient named be better off without any teeth at all, but we have found that the old man on prophylaxis receives just as great benefits as the

young person. This system will not only maintain oral cleanliness, but prevents, to some extent, the atrophy of the ligament attachment of the teeth. Old people who are on this treatment are very enthusiastic, and as free from general constitutional troubles as it is possible for them to be.

FREQUENCY OF TREATMENT.

In conclusion, children should be treated at least once a month, and persons from twenty-five to thirty about once in three months. From forty-five on the treatment should be given once a month.

Frequently dentists on viewing the mouths of regular prophylaxis patients in my office have expressed the thought that it did not seem necessary for teeth so clean and in such good condition to have further treatment. This is the key note of the whole situation. It would be simply oral hygiene to clean the teeth, but here we have something deeper. The patients on prophylaxis come to us not for cleaning, but for the results in the true meaning of prophylaxis—the guarding of the oral cavities from the entrance of infection.

In prophylaxis we presuppose that all adhesions have been removed and all tendency towards any pathological condition has been eradicated and that the treatment will be directed to those places which the patients themselves can not reach.

OBJECT OF PROPHYLAXIS.

The claim of Smith, that the peridental membrane is of more importance than the crown of the tooth, has been borne out by investigation of the origin of pyorrhea, and the quicker this is recognized, and the quicker we diagnose any inflammation at the gingival margin of the peridental membrane, the more certain we will be of freeing our patient from any possible danger. There is some doubt whether there is ever a reattachment of the pericemental

fibres after they have once been detached by disease. This emphasized the necessity of prophylaxis as a preventive of pyorrhea.

We have learned that the caries of the teeth are dependent for the most part upon two formations, the carbo-hydrates and micro-organisms. As neither of these factors can be eliminated, all that we can do is to learn as much as possible how to hold either or both of these elements in check. Unfortunately, the very articles of which we eat most freely, that is, pastry, candy, etc., give the largest percentage of carbohydrate and acid units.

As it is difficult at the present time to control the matter of diet the object of prophylaxis should be to eliminate as far as possible the effects, and certainly the first question to be taken up is that of *logibility*. Thus we find that those substances which are either alkaline or neutral in effect are chocolate, biscuit, milk, dates, etc., while substances such as potatoes, lemons, pine apples, nuts and meats, being originally acid in reaction, are beneficial.

The conclusions which are reached by Pickerill after considerable experimentation along this line, are:

"That in order to prevent the retention of fermentable carbohydrates on and between the teeth, and so eliminate or very considerably reduce the carbohydrate factor in the proportion of caries, starches and sugars should on no account ever be eaten alone, but should in all cases either be combined with a substance having a distinctly acid taste, or they should be followed by such substances as have been shown to have an 'alkaline potential,' and the best of these are, undoubtedly, the natural organic acids found in fruit and vegetable."

Those races where comparative immunity from decay is found, undoubtedly produce the result by the constant use of salivary stimulants producing in the salivary glands a

constant activity which prevents stagnation in the oral cavities, and thus preventing predisposition to decay.

Several references have been made heretofore to the softness and stickiness of our foods which, lodging between the teeth, give a start towards caries. The child's taste is a guide which, instead of giving heed to, we have always sought to ignore. The child naturally calls for the articles of diet having an acid reaction, fruits, salads, candies, etc. The harm does not come to the child's teeth from these substances, but from the form in which they are eaten—sticky, doughy cake for example, sticks between the teeth and stays for future decomposition. I have no doubt that candy in the pure state is not only non-detrimental, but of great food value, and a preventive of decay. We may well consider the food, and lunches furnished to the children as a probable cause for these defects, in that most of the meals are made up of salivary depressants. Added to this fact, we must remember that the debris stays around the teeth, and between them until the next meal. The child's prophylaxis should begin by recommending to the child or his parents the addition of more fruit to his diet, and that this fruit be eaten, not before the meal, but after it in order that the salivary glands may become excited, and remain so until the debris is rendered soluble or washed away by the flow of saliva. We, as dentists, formerly thought that salads and condiments were very detrimental to our patient's teeth. However, used in the right way, there can be no detrimental action.

Tea is one of the salivary depressants, and should not be given to children at all; if our grown-up patients use it, we should insist that they do not end a meal with this drink, but use it in the first part of the meal, for, used in the latter part of the meal or with the dessert, it stops the flow of saliva for some time, allowing the micro-organisms of the mouth to multiply very rapidly. Some one has said that were

lemonade drunk as a universal beverage it would be impossible to have typhoid fever. This alone is a recommendation for this most excellent beverage, but, when we couple to this, the fact that fruit acid is one of the greatest salivary stimulants, we should not fail to take advantage of its beneficial qualities.

All this leads us to the fact that the aid we secure from nature in the prevention of caries must be through increasing the activity of the nerves leading to, and having control of, the salivary glands. These being brought to their highest development, we have a prophylactic fluid far superior to anything that can be made artifically. We can accomplish by mouth washes and dentrifices some things (dealt with in a later chapter) but let us start off our prophylaxis with the knowledge of the fact that nature has this great preparation ready to manufacture at our suggestion.

CHAPTER XIII.

THE PROPHYLAXIS CLASS.

PRELIMINARY WORK BEFORE ENTERING PATIENT ON PROPHYLAXIS.—PROPHYLACTIC TECHNIC.—VIEWS OF KELLEY, GOBLE AND JOHNSON.

When we have finished our dental work, and have taught our patient the importance of oral hygiene, the question which will be asked the doctor is, "Now, doctor, what can I do to keep my mouth in this condition, and how often must I come back for examination?" If the facts and arguments which have been brought forward in this book have been of interest to you, it is hoped that you will start what I call the "Prophylaxis Class." This is somewhat original with me. I tell my patients, that if they are serious in their desires, I will take them at a nominal fee for one year if they will agree to come as often as I think necessary to keep their mouths in perfect condition. There is no use to advise patients to go on prophylaxis while you have reason to believe that they will not carry out your instructions, for it is a waste of time and embarrassing at the end of the year to find that the patient's mouth is in no better condition in spite of all your work. Many times, however, I have seen a gawky boy who was a perfect stranger to a tooth brush, after six months of this treatment, acquire oral hygiene habits which he would follow all his life. Young girls would probably be the best to enter upon this treatment in beginning this work. I do not want any one to enter the class on the first blush of enthusiasm. I generally give them a reprint on the subject to take home and read. My policy of educating patients is to select some good article

appearing in a dental journal and secure from the author the necessary reprints. I have always found the author glad to supply them. Then, if they are willing to fulfil the demands made on them, I gladly place them upon the list. One of the worst difficulties in getting the patient ready for prophylaxis is banded crowns, cement and gutta percha fillings. These necessitate considerable dental work. We should have some every-day illustration to use in explaining to the patient the necessity for having this work done, in order to show them that it gives lodgment for debris which would overcome all our efforts at prophylaxis.

PRELIMINARY WORK BEFORE ENTERING PATIENT ON PROPHYLAXIS.

Before the treatment is begun all dental work must be brought up to the standard. All roots of teeth, which can not be saved, must be extracted. All meat holes and fillings with bad contours must be corrected. All tarter must be removed, and the teeth put in a hygienic condition as described under "Cleaning Teeth." All this, of course, must be paid for at regular fees, for, as I have said before, prophylaxis presupposes a perfectly clean mouth.

Fones gives the illustration of two pieces of glass each five inches square. One of these is ground, and the other polished plate glass. Both are smeared over with the debris which we would find in the average mouth. With one sweep of the tooth brush it is easy to clean the polished surface, while it takes several motions to clear the ground glass surface. Another illustration is the cement slab at our chairs. When this has become scratched or rough, we find difficulty in removing the cement left over from our operation. On the other hand, when the slab is new and free from these defects, it may be cleaned by simply placing it in water and wiping off the cement. Now the same thing holds true in the mouth. If the patient is on prophylaxis and the teeth

kept in the proper state of polish by the monthly treatments, he can with one sweep of the brush remove any deposit which may have settled on the teeth, but if this food debris is held by accumulations of tartar, as found in the average mouth, it can only be removed by a dentist.

PROPHYLACTIC TECHNIQUE.

A few years ago at one of the state societies where I was giving a clinic, a countrified-looking dentist pushed himself to my side and said, "What the devil is a prophylaxis treatment anyhow? One of your patients moved to my town and insisted that I give her a prophylactic treatment. I wrote to you to find out what it was, but the answer must not have been correct as I gave her a treatment and she never returned." An explanation of the conditions which necessitate prophylaxis makes a much greater impression than the statement of the simple technique necessary to bring about the results. In the art gallery, we stand enthralled before some master painting, we live with the person or in the scene which it depicts, and enter into the vision which caused the picture to be painted. Had we been in the studio where this work was done, we would probably not have shown any interest in the small brushes and pallettes of paint with which the artist made the picture. Thus I have found that I could interest dental students and keep up their enthusiasm until I began the description of the technique. They expected something big, and when I told them of its simplicity, the enthusiasm had a tendency to drop. The technique of Prophylaxis is nothing more than the technique of cleaning the teeth, only carried out to a much greater nicety, and, in addition, the regularity with which it is carried out. One prophylactic treatment will not amount to much, but the effect of a half dozen of these treatments, each one overcoming some defect, makes a vast difference between these two operations.

Dr. Henry A. Kelley says:

"In beginning our spraying and polishing, the first condition that confronts us is a viscid coating of saliva and gelatinous plaques that covers the teeth and gums. First take a tube of rather hot water, of about 150° F., to which has been added one dram of aromatic spirits of ammonia. The alkalinity of this spray, applied under a pressure of from 35 to 50 pounds, will overcome this viscidity. After thorough spraying with this first spray, alternate with a second spray, composed of three-quarters of a tube of warm water and one-quarter of a tube of some of the forms of hydrogen dioxid. To this tube add a few drops—three or four—of essence of anise to disguise the very unpleasant hydrogen dioxid taste. This second spray is used on account of its cleaning effect. As the dioxid comes in contact with the decaying particles of animal matter we have the well-known boiling effect, which tends to lift out and off all foreign matter accumulated around the teeth. Then with a hand porte-polisher (I use Harrell's) charged with flour of pumice begin the polishing. The pumice must be moistened with water to make a paste not too thin, to which two or three drops of essence of peppermint are added. The peppermint serves not alone to take away the sandy taste, but also to exert a cooling effect on the gums, and leaves a refreshing and clean taste in the patient's mouth after the operation is finished. I usually go over all the teeth in a rather hurried way in order to first get rid of any matter adhering to the surfaces, and then after another spraying, alternating with both sprays, I pass to the last tooth on the upper left side and go over all the buccal and labial sides of all the upper teeth, going into the approximal spaces as well as possible with the porte-polisher. Use flattened orange-wood points for the flat surfaces, applying considerable force with a circular movement directed from the neck to the cutting edge and just under the gum margin. This gum margin

is a very important region, and it is probable that if this is kept well polished your patient will never have pyorrhea, or if he has had it, it will never return. Having gone around to the last tooth on the upper right side, spray again with the second spray, and return to the last tooth on the upper left side, going over the lingual surfaces and then spraying with the second solution. Then polish your grinding surfaces. The same process is followed with the lower teeth. Go over all exposed surfaces with your porte-polisher charged with tin oxid made into a paste, which will impart a beautiful polish to these surfaces. Then apply a thorough spraying with a third solution, which consists of one-half a tube of hot water to which has been added one-half a tube of some pleasing general mouth-wash (I use Alkalyptol, which I find very satisfactory; not all antiseptic mouth-washes leave the same refreshing taste in the mouth), and pass waxed floss between all the teeth and clean out the interproximal spaces, spraying with the second solution as necessary. After that finish with the third spray, finally allowing a rinsing-out with a glass of cool water. If your work has been thorough, your patient has the first sensation of what a clean mouth means. Patients often tell me that they hate to go home and eat and soil the mouth again.

"It is well to alternate from month to month, taking the upper teeth first in one month and the lower teeth first the next month. I find that for some reason which I can not explain, the upper teeth respond to treatment, especially in pyorrhea cases, much more readily than the lower and I have these two thoughts to offer in this connection. I find that when I begin with the upper teeth I often spend forty minutes going over them, which leaves me but twenty minutes of the hour appointed for the lower; hence the practice of alternating from month to month. The pumice also becomes much thinner from the admixture of saliva in polishing the lower teeth. I often use the saliva ejector or nap-

kins to offset this latter condition, but I can not as yet say with what result. When you first begin to polish with the pumice, your wood point will slip over the tooth, and there will be a slimy, greasy sensation. But as you polish and polish, you get down to the clean tooth-surface, and then you experience that squeaky sound that indicates a clean tooth-surface. The slimy substance that you are removing is composed of the gelatin-forming micro-organisms, which I shall explain later in a quotation from Johnson. Hence, if you make every filling smooth, allow no shoulder, or lodging-place for the decay-producing germs to remain, and then destroy the gelatinous film under which the micro-organisms that cause decay are enabled to effect their destructive process, you render it extremely hard for decay to begin or make progress."—From *Dental Cosmos.*

Dr. Kelley suggests the use of a nasal spray tip, made by Debilbiss Co., which he uses to spray out the inter-proximal space from the buccal side. Place the index finger just over it (that is above it, on the upper, towards the root end) draw it back just a little and spray. The spray thus goes beyond the tooth and out on the palatal side. Following this suggestion Dr. Kelley says: "The patients realize how you have cleaned the teeth."

The first step is the use of a small scaler of the Younger type (with its sharp edge removed) which is gently inserted under the free margin of the gum and carried around the entire gingival portion, being careful to exert no force on the instrument which would in any way tear the attachment at the peridental margin. I consider this the most important part of prophylaxis for it is this membrane above everything else which must be protected. It is here that the beginnings of deposits may be detached in their incipiency. No porte polisher or pumice will do this; only skilled touch and the proper instrument can do it.

The mouth in which there has once been a pyorrheal condition will often call for a fine point of judgment, for it is often necessary to enter forcibly into these former pyorrhea pockets and clean them out thoroughly. This, if rightly done, can do no possible harm, and certainly is the means of preventing future eruptions from some infection forcing its way into these places. If this is done every three or four months it will in time do more to eliminate this scar than any other treatment. It seems that with each treatment the pockets get shallower.

Use dental floss immediately after instrumentation for the reason that at this time the mouth has no accumulation of powdered pumice which would make it most difficult to pass silk between the teeth. Do not put the abrasive on the silk and then attempt to pass it between the teeth. Pass the silk in first, and then place on a small amount of abrasive. The same procedure is repeated at each interdental space. The largest and broadest floss silk that can be passed between the teeth should be used; this is the danger line at which we make our greatest fight against caries and the simple running of the floss silk between the teeth will not accomplish the desired results. According to late investigations by Pickerill, it might be better to substitute for the spray containing aromatic spirits of ammonia, to overcome the viscidity of the saliva, some vegetable acid spray which will not only give an increased flow of saliva, but will furnish the protective qualities which it possesses, and will remain for some time after the prophylactic treatment; this flow of saliva is undoubtedly inhibited by an alkaline spray.

Dr. Gillette Hayden called my attention to the use of powdered sodium citrate for the removal of mucus collections. Dr. Cook, of Chicago, endorsed it, claiming that it attacks only organic substances, without detriment to the teeth or the soft tissues. It can be used at the chair in connection with the abrasive used in the treatment, but must

not come in contact with any moisture previous to the time of using it. Use it with water instead of any other fluid as it combines readily with other substances.

Opposed to this system of prophylaxis, is that of Dr. L. S. Goble, who writes of his technique in a recent number of the "Dental Dispensary Record." He prefaces his remarks by saying that for twenty years he has been doing prophylaxis work in spite of uric-acid and rheumatic diatheses, and found that the only way to properly carry out prophylaxis was to remove the tartar, and keep the mouth clean. He further says that he is not in sympathy with the so-called "Prophylaxis Movement."

"Like the cry, 'On to Richmond,' we yell, 'Remove the Plaques,' and so the whole mouth is scrubbed and the gums are punched and stain is used, all on the basis that a micro-organism is the cause of caries, although it has not been isolated and the theory has not been proved. Do the plaques stay removed? No, they return in full force in six hours and in some people's mouths in two hours, showing that the micro-organisms are always there and rightfully there. You may ask, 'What do you say then? Let the plaques alone?' No, I say remove them in so far that you do not injure the gum tissue and only that far. And this putting stain on the teeth and then tearing the mouth to pieces getting it off, just to show the patient where the plaques are, I consider a mistake or worse. And to have all your patients come once a month for prophylaxis is rank nonsense, and I have seen many evil effects from it. I have, and you have patients whose mouths after three months have no more plaques than other patients have after six hours. The former under the monthly rule, you would rob, the latter you would be neglecting. I have patients that come year after year and who need no oral prophylaxis and yet I have no doubt that I could show plaques. I do not believe that plaques cause decay, but as a media for the acid of fermenta-

tion going on in the mouth they may cause one per cent., I doubt if it is more."

The above quotation of Dr. Goble is rather extreme and yet such expressions are useful to curb our ultra-enthusiasm for this new departure. Along the same line of caution we read from the pen of Dr. C. N. Johnson, in a recent paper (Dental Society of the State of New York, 1915) the bad things we must omit in our prophylaxis work.

"To prevent disease is more laudable always than to cure it, and our chief efforts should be centered in this direction. But in his wildest day-dreams the man who first called attention to this practice, Dr. D. D. Smith, of Philadelphia, never imagined the extent to which it was to be carried by some practitioners. To conscientiously remove deposits from the teeth and polish the surfaces smooth and bright where they had become stained and roughened, is a legitimate and altogether worthy method of practice, to stimulate patients to better care of the teeth and to have constant surveillance over conditions in the mouth by frequent stated inspections must be considered a policy of reason and conservation. But to ruthlessly go into a mouth with stones and disks and strips, and to grind and cut and slash as is being done by some operators is wholly unwise and in certain instances borders almost on malpractice. To saw this strip back and forth in the interproximal space, lacerating the gum to shreds, and cutting into the tooth tissue in the gingival region, in many instances, does more harm than good. There is no need for creating this discomfort if the operator will go about his prophylactic work with reason and judgment, removing the deposits most carefully with delicate instruments and polishing and smoothing the tooth surface without cutting and slashing into it as if it were so much inert matter. To transform a mouth from a state of disease to one of health by prophylactic treatment and do it rationally is a process extending over some time instead of a radical and

immediate operation of the 'presto change' character. And this can be done without subjecting the patient to intolerable pain or subsequent discomfort.

"Another consideration connected with the practice of prophylaxis relates to the folly of instituting treatment of this sort in a perfectly healthy mouth. This is frequently done on the plea that it will prevent disease of the gum and decay of the teeth, and the promise is confidently made by the dentist and naively accepted by the patient that if prophylactic measures are followed once a month there will never be any caries or pyorrhea in that mouth. The burden of preservation is thereby placed upon the dentist instead of being placed where it properly belongs, upon the patient. It is the daily care the patient gives the teeth rather than the monthly care of the dentist which counts most for the maintenance of health, and this should always be emphasized in any discussion of the matter with the patient. * * * *

"Then again to promise a patient that there will be no decay of the teeth if prophylactic measures are instituted each month is a hazardous thing to do. In some mouths where the influences of susceptibility are especially active, cavities will occur at times despite our best efforts, and when this happens it must call for some very ingenious explaining on the part of the dentist. Fortunately for themselves some of our colleagues are really very ingenious at this kind of explaining; but it would assuredly be better for their subsequent equanimity if they were frank enough at the outset to say to their patients that while prophylaxis is a most excellent procedure under its proper indications and will aid greatly in minimizing the tendency to decay, that there is yet no panacea or absolute preventive for dental caries known to man. This would be safer, and I venture the assertion that it would not lessen the ultimate respect the patient has for the dentist or for prophylaxis."

CHAPTER XIV.

INSTRUMENTS AND POLISHING MATERIALS USEFUL IN PROPHYLAXIS.

Authorities do not agree as to what constitutes the proper instrumentation for prophylaxis. Some advise against the use of anything like a scaler, while others advise the regular use of a delicate scaler under the free gum margin, and the reopening and cleaning out of old pyorrhea pockets at frequent intervals.

The condition before treatment, and the present state, together with a full understanding of the normal and pathological picture presented by each case, must govern the operator on this question.

Instrumentation used with a proper knowledge of the demands of true prophylactic treatment can only be productive of good. Whatever points selected and used should have the sharp edges removed.

The various shapes of spoon excavators can be made into most excellent instruments by removing the edge with a stone. Many of the instruments hereafter described for pyorrhea work are also useful in prophylaxis. Numbers 3, 4 and 15 of the Good set have been of greatest service to the writer.

INSTRUMENTS FOR HAND POLISHING IN PROPHYLAXIS.

There are a great many porte polishers on the market which are herewith illustrated (Fig. 63.) Dr. Harrell invented the best instrument ever produced for the purpose of prophylactic treatment. The sale of this prophylactic pol-

isher is now controlled by the Oxylene Company of San Antonio, Texas.

In the porte polisher various kinds of points can be used. Generally, however, they are made of orange-wood, and shaped out into a point or into a wedge. In addition to the porte polisher, it is well to have about a dozen large size orange-wood sticks sharpened into various shapes for immediate use. The wide points should be used on the broad sides, and the small ones between the teeth and in the fissures.

A new point must be placed in the porte polisher for every patient for as soon as patients begin to learn something about prophylaxis, the treatment and technique, they are very particular and watch very carefully to see that everything is as aseptic as it should be. If the sticks of orange-wood or bass-wood be used, the wood should be washed carefully, a new point cut, and the sticks kept in a glass jar filled with antiseptic solution. Before I began doing this, I frequently had patients ask me if I used the same stick on all of the patients.

Dr. Kelley suggests the use of strips of shoe peg wood, which can be cut to the exact width required. He claims that these have the advantage of orange-wood sticks in that they give an expansive flat surface for polishing the flat surfaces of the teeth, and that they are much superior to the regular orange-wood sticks. They can be procured very cheaply at any shoe factory or wholesale shoe shop. Dr. F. H. Skinner furnishes with his instruments, a box of prepared orange-wood points which are excellent. The S. S. White Dental Manufacturing Co., and the J. W. Ivory Company, make a specially shaped point, for use in porte polishers, which is quite an advantage in some places. The greatest aid as a substitute for the orange-wood stick is the contribution of Dr. J. W. Jungman, which consists of round bass-wood sticks about six inches long, which are placed in

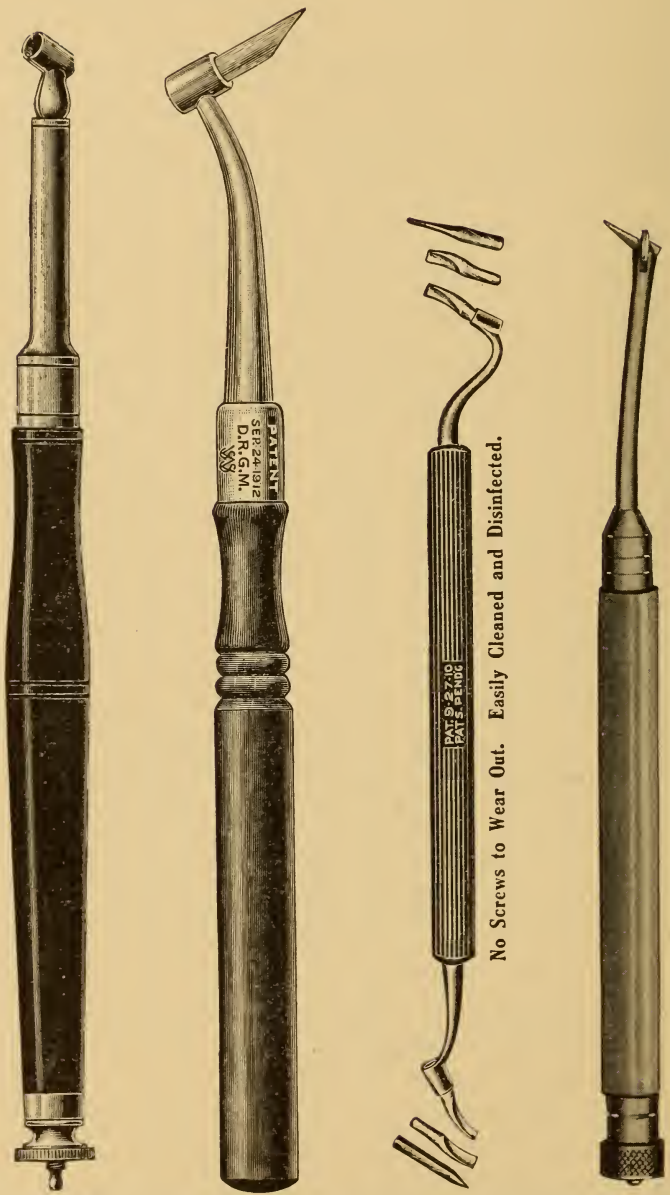


FIG. 63. THE BEST FORMS OF HAND POLISHERS FOR PROPHYLAXIS WORK.

a 1 to 1000 solution of bichloride with green soap. They should remain in this until thoroughly saturated. (Fig. 64.)

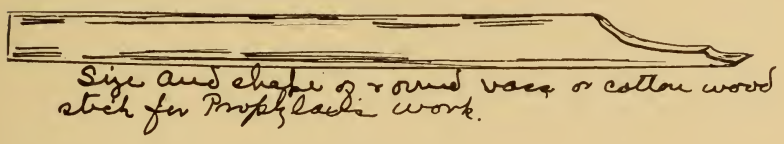


FIG. 64.

Dr. Jungman furnishes me the following formulae which he prescribes and dispenses to his patients for use on their brushes. These also make excellent stock preparations for use at the chair to charge the bass-wood polishing sticks:

No. 1

Prescribe in cases of pyorrhoea where the enamel will permit the use of a gritty powder.

Pulv. Castile Soap.....	Parts	¾
Zinc. Sulpho Carb.....	"	1
Pulv. Pumice (Fine)...	"	6
Oxide Tin, (Merck's)..	"	3
Creata Precip	"	12

Flavor, Q. S.

No. 2

Where it will not permit a gritty powder.

Pulv. Castile Soap.....	Parts	¾
Sacch. Alba. Pulv.....	"	1
Oxide Tin, (Merck's)..	"	4
Zinc. Sulpho Carb.....	"	1
Creata Precip.....	"	12

Flavor, Q. S.

No. 3

In well-kept mouths where no medicament is required.

Pulv. Castile Soap.....	Parts	¾
Sacch. Alba. Pulv.....	"	1
Oxide Tin, (Merck's)..	"	3
Creata Precip	"	12

Flavor, Q. S.

No. 4

In acid mouths.

Pulv. Castile Soap.....	Parts	¾
Sacch. Alba. Pulv.....	"	1
Oxide Tin, (Merck's)..	"	3
Sodium Borate (Squibb's)	"	2
Creata Precip.	"	12

Flavor, Q. S.

I secure large mouthed bottles, such as those used for barbers' pomade, which hold about one-half pint. Into these I put the various stock mixtures which I use in prophylactic work.

From the ten-cent store I secure about one dozen old-fashioned open salt cellars. Just as soon as the instrumenta-

tion is finished, the assistant places on the table two of these little glass receptacles. These are filled from the stock bottles. One contains whatever cleanser or abrasive the case calls for; the other, the finishing or polishing mixture. The cleaning mixture is best used moist, while the polishing powder is used dry.

In beginning this work, we must be cautious not to use the common pumice stone, as it will cause cupping in at the cervical margin of the teeth. From the use of this heavy abrasive, I have noticed cups in the teeth of a number of patients. After the patients have been on the treatment for several months it is not necessary to have this abrasive used every time. The finer mixtures of oxide of tin, prepared chalk, or the various preparations on sale for this special purpose may be used. The views of Dr. Carmichael on the subject of the abrasive for use in prophylaxis are interesting:

"The polish or gloss of enamel was put there by nature to protect the teeth from diseases. If this highly glossed surface of the tooth enamel was retained, foreign matter could not readily adhere and if the surfaces were always polished to the gum margin, the teeth would not decay, nor would there be dental pyorrhea.

"All the substances in general use for cleaning teeth are harsh and gritty; though they be very fine grit, they accomplish the purpose only by a scouring process, thus gradually destroying the natural gloss of the enamel. Although these scratches are not visible to the naked eye, they are sufficient to destroy the brilliancy, and leave the surface all the more susceptible to receive foreign adhesions; in other words, the more we scour the teeth, the more we must scour, to keep them clean; to say nothing of destroying the life luster; as proof of this, it is only necessary to dry the teeth to disclose the fact that the enamel gloss has been dulled.

"It may be necessary, nevertheless, for the dentist to apply a very finely powdered abrasive to remove stains in cleaning teeth, and this should not be used over the entire surface of the teeth, but confined to the stained area, using a preparation of a character that will not scratch.

"Experience has proved that a friction dry rub is not only more effective in removing the adhesions, but the life luster becomes more intensified.

"The enamel must be kept so brilliant that the teeth will ward off disease. To accomplish this, we must adopt those measures that will restore the teeth to a state of nature, which is in line with the highest attainment in dentistry."

In the use of any polishing instrument bear in mind the curvature of the teeth, and do not rub in one place, up and down, but follow the curvature of the teeth in a circular motion, and at a *slow rate of speed*. In this manner, we are enabled to feel any accumulation which we wish to remove. If the point slips over the tooth as though it were greased, we know that it is enveloped in a secretion which must be removed. We must educate our fingers up to this delicate sense of feeling. We soon learn that a regular patient's teeth feel entirely different from one who has not had this care. There is a peculiar *squeek* of the patient's teeth, and the minute we hear this, we have caught on to the proper manner of handling our porte polisher. Just at the free margin of the gums it must be polished very carefully. Many operators, through too rapid movement of the porte polisher or through fear of injuring the gums, lose much of the importance of this work. I have not found the contact of the porte polisher against the gums to be injurious, if rightly used.

CHAPTER XV.

PROPHYLACTIC TREATMENT OF FISSURES AND GROOVES, SOFT SPOTS AND SENSITIVE AREA TREATMENT.

FISSURES AND GROOVES.

As previously mentioned the fissures, grooves, and pits in the teeth will cause us the greatest amount of trouble. The first time that this condition occurs in the mouth is following the eruption of the first lower molar. It has been my practice for years to attend to these teeth as soon as they appear through the gums, whether the patient is on prophylaxis or not, but certainly if on prophylaxis. The tooth should first have the sulci cleaned out with a fine pointed instrument. The surface of the tooth is then cleaned off with some mild abrasive. The tooth is kept as dry as possible, and then sterilized with absolute alcohol. When this is done, the whole erupted surface of the tooth is covered with some quick setting cement. Many prefer one of the copper cements, but I have never seen any advantage in using it. The erupting permanent tooth being behind the temporary molars, at a lower level, furnishes a depression which forms an ideal catch basin for decaying foods. Again, if the children brush their teeth, which they seldom do at this age, it is doubtful whether they ever clean this surface. As the tooth grows up into place, the chewing of food soon wears all the cement away except that portion in the grooves. As soon as the tooth is brought into use for mastication, if this cement has not been worn away, it can be removed, and in many cases we will find that no further attention is necessary. However, if deep sulci have

developed, we can, with a real small burr, cut the fissure just sufficient for a small gold filling, or, perhaps, the little groove can be filled with cement (Fig. 65). It will be surprising to note how this will last in this small line cavity.

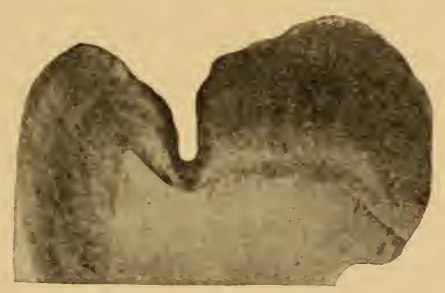


Fig. 65. Fissure in Lower Bicuspid (Solbrig).

Such a tooth, unless properly treated, is almost sure to develop a serious decay in the fissure.

Sometimes the simple opening and bevelling of the walls that lead to the sulci so that the tooth brush can reach down into it, is all that is necessary. The grooves in the buccal surfaces of the teeth should be ground out with the smallest stone possible and then the surface thoroughly polished. However, if the groove is of such depth that the grinding will go through the enamel, or, as is often the case, a small pit shows somewhere along this groove, it can be filled with a cement filling, as this is probably the best to put in this position.

SOFT SPOTS AND SENSITIVE AREAS.

Soft spots at the juncture of the teeth and the enamel margin where previous recession of the gums has taken place, have proved one of the most disappointing operations in prophylaxis, and yet I feel that the percentage of successful work along this line is sufficient to warrant me in giving the technique; it is certainly worth while to try this method, even if the tooth should require a filling some years later.

Small white spots in children's teeth can be polished away. The method of doing this is to take the smallest size mounted stone, grind down to hard surface, and then apply cuttle fish discs, and finally polish off with an old-fashioned moose hide polishing point or with Darby's Hard Buff Polisher No. 3, used in the dental engine. On this polisher should be used oxide of tin or some preparation such as "Carmi-Lustro," provided the decay or white decalsification does not extend through the depth of the enamel. However, more extensive decays just over the juncture of the cementum and the enamel on the tooth root often present a leathery surface which is very difficult to handle with this protective technique.

The surfaces in the anterior part of the mouth might be handled with such substances as nitrate of silver hereafter described, but this being a question of position, the next best thing is to try the polishing technique. If this leathery condition does not extend into the interspaces, we sometimes get excellent results by the simple removal of this condition and polishing the surface as just described after removing this leathery substance. If we find a cavity, now is the time to fill it. However, if we reach sound tissue, we should have a cup-shaped surface. This surface can be maintained in a polished condition and it may not require filling for many years. Many times in attempting to operate at this point we find an extra sensitiveness, and the patients will sometimes say that they would rather have the tooth extracted than have you polish this spot. This is the time to use the procedure given me many years ago by Dr. Taylor, who sprinkled a small amount of powdered cocaine over the gum margin, allowing the moisture to dissolve the crystals. He advises that the cocaine be used in about the same manner as when applying the rubber dam, but cautions the operator not to allow the patient to swallow it. Dr.

Taylor used this method for many years without the slightest symptom of trouble.

One other point which can be used in the treatment of these sensitive spots at the gum border, especially after they have been cleaned out, polished, and are still sensitive, is the application of a small burnisher.

The patient's head is held firmly, and the hand holding the burnisher is held against the tooth which is to be treated. Great pressure is applied with up and down motion, being careful not to let the instrument wound the gum margin. This burnishing should be kept up for several seconds. It is remarkable what relief this method sometimes affords, a considerable length of time elapsing before the return of the sensitiveness. I can give no better explanation of this than the answer given by the student who said that this burnishing "brads the nerve terminals at this point." There are undoubtedly irritated and exposed nerve ends, and the patient will tell you so when you attempt to do the operating. The successful "bradding" in my own mouth on an upper bicuspid, where there has been a slight recession of the gums, has afforded me the greatest relief of any procedure which has been suggested or tried.

In small mouths, I use one of the various cheek distenders, which not only enables the operator to work with greater ease, but also furnishes much comfort to the patient.

CHAPTER XVI.

METHODS OF NOTIFICATION AS USED BY KELLS, FONES, AND ADAIR.

Since the whole idea of prophylaxis is founded on *regularity* and system, it is well for each dentist to work out some individual scheme to carry out this idea. Dr. Smith simply telephones his patients once a month. Dr. Kells has a list upon which he places the names of all patients at their request for regular attention. At stated intervals from this list he mails cards as per illustration (Fig. 66).

DR. KELLS WOULD REMIND

M .....

that the time has now arrived when, to insure their best care,.....teeth should be examined.

1237 Maison Blanche.
Phone Main 1617.

FIG. 66. NOTIFICATION CARD OF DR. KELLS.

Dr. Kells' idea is that he wants the patients to know that he is interested in them, but does not wish to place himself in a position of commanding them to come to his office, as it might be embarrassing to call a patient who had decided to go to some other dentist. The recipient of this card is not commanded to come to him, but is just reminded that his teeth need some attention and he may go where he pleases for this work.

Dr. Fones mails the patient an engagement card when he thinks it time for his teeth to have a treatment. In order that he may know whether the patient has received this notice or not, he encloses with the engagement card a self-addressed, stamped envelope, which contains a second card bearing the same date as the notice which is to be signed and returned by the patient. (Fig. 67.)

Dr. Alfred C. Fones:
Your appointment card for
June 3d, at 3 P. M.
has been received and accepted.
Signed.....

FIG. 67. NOTIFICATION CARD OF DR. FONES.

If the patient had to telephone his acceptance or write a note, Dr. Fones might not be sure as to a definite engagement. By this system he makes it so easy that the patient readily signs the return card, and mails it in the envelope already addressed to Dr. Fones.

Others doing prophylaxis, simply leave it to the patients to come in at regular intervals. None of these plans seemed to fit my ideas of carrying out this work so I devised the following scheme:

At first, I designated certain hours throughout each day for this special work. Mrs. ———'s appointment was on the 10th, and she was reminded the day previous. So on down the list. This scattered the work all through the month and interfered with regular dental operations. The next plan was to bunch all this work into whole days, and the organization of what I call my "Prophylaxis Class."

Certain days in each month were devoted exclusively to this work and set aside accordingly. For instance, the second Tuesday, Wednesday, and Thursday in each month. Afterwards I added other days as new patients accumulated. (Fig. 68.)

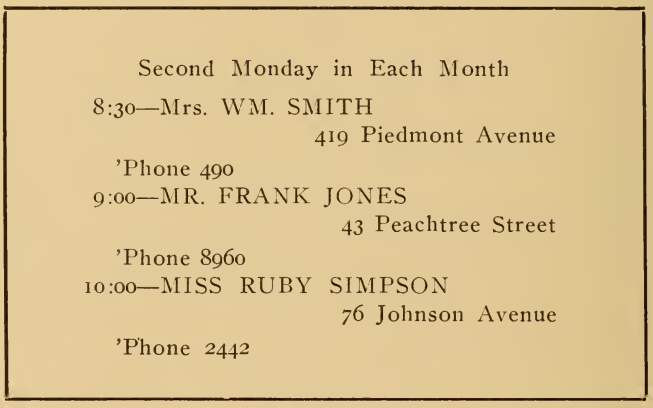


FIG. 68. PART OF BOOK FOR SPECIAL PROPHYLAXIS DAYS, SHOWING PERMANENT ENGAGEMENTS FOR NOT LESS THAN A YEAR.

The book used was like an ordinary dental engagement book, only the engagements were permanent, and the book had only eight or ten pages, each page representing a day. By referring to the cut of the engagement book, you will see that we knew Mrs. Smith had a permanent engagement (Fig. 68). Her time was paid for whether she came or not. By adhering closely to these engagements of one-half hour each, we found that we could treat from twelve to fifteen patients in each of these days. Now having a list like this of several days, it was out of the question to phone all of these patients every month so I had printed the card of notification which is mailed the day previous to the time for treatment.

A large number of patients to treat, and this work exclusive for the day, make it very interesting, both to myself and the patients. These cards are neatly printed and only the dates have to be filled in by the secretary.

The day before his *first* engagement he receives a postal card with his dates (Fig. 69).

SECOND MONDAY IN EACH MONTH

Dates for Prophylaxis Treatment

Preserve this Card

January	Monday	10,	at 9	o'clock
February	"	14	"	"
March	"	14	"	"
April	"	11	"	"
May	"	9	"	"
June	"	13	"	"
July	"	11	"	"
August	"	8	"	"
September	"	12	"	"
October	"	10	"	"
November	"	7	"	"
December	"	12	"	"

Charge $———— per year.

A reminder card will be mailed previous to each date but failure to receive such notice does not entitle patient to another engagement in the same month without extra charge unless failure to be present is due to unavoidable cause in which event notice must be given several hours in advance.

The charge for prophylaxis is by the year for twelve regular engagements, and is payable semi-annually in advance. If for any cause these treatments be discontinued before the expiration of contracted time a charge of $—— will be made for each date up to the time notice is reveived to discontinue.

Appointments are not to be changed more than three times per year.

FIG. 69. WHEN PATIENT ENGAGES A YEAR OF PROPHYLAXIS DATES, THE SECRETARY MAILS TO HIM A POSTAL CARD WITH ALL DATES FOR THE SELECTED DAY AND HOUR.

For each succeeding engagement he gets a postal card very similar (Fig. 70).

Your Engagement for Prophylaxis is----------

---------- at----------o'clock

The charge for this treatment is by the year from date of first engagement and is payable in advance. The date and hour is fixed, if possible, to conform to convenience of patient and is not to be changed oftener than twice a year.

As this time is reserved, failure to meet engagement results in loss to patient and can not be made up unless the absence is caused by Providential hindrance, in which event notice must be given a day in advance.

FIG. 70. SEVERAL DAYS PREVIOUS TO EACH DATE FOR PROPHYLAXIS, THE PATIENT IS MAILED THIS CARD OF REMINDER.

The patients should not commence our system of prophylaxis unless they intend to stay at least a year; we enter the charge in our ledger for one year, and a bill is rendered them for one half, or the whole of the amount. This must be paid in advance if this time is to be saved for them.

At the first appointment, on the record ledger sheet, we make a note of all cavities, including the incipient ones, and all defects of the mouth. The patient should be made acquainted with all these conditions and shown the note in the dental ledger. At the first treatment the patient must invest in two brushes, floss silk, and dentrifice cream, and he is taught how to use them. One brush has the name of the patient engraved on the handle with a dental bur and made plain with a smear of ink. This is kept in the office in the formaldehyde sterilizer to be used solely for teaching the patient to care for his teeth. The patient, at first, does not understand all this business of cards and dates but the system keeps up his interest. After the third visit the benefit is apparent, and the patient is yours to command. After years of study and practice this system has been evolved as the most efficient method of handling the work.

CHAPTER XVII.

METHODS OF NOTIFICATION AND RECORDS OF CASES.

NOTIFICATION OF PATIENTS—RECORDS OF CASES.

BY DR. JOHN OPPIE McCALL.

"These two subjects are considered in one chapter, because the two things can be very readily and advantageously combined. This is done by having the record chart printed on a 6x4 card which is kept in a card index system, and which thus serves as the basis of the follow-up campaign, so necessary to secure the best results in this field.

"We will consider modification and follow up first. The back of the record chart shown below may be ruled in several ways according to individual ideas. The main thing is to have columns for date of appointment, length of time consumed, and remarks. The writer does not keep the financial account on this card, and for several reasons. The card is to be laid on the bracket table while patient is in the chair. It thus serves as a record of past appointments with their possible history of delinquency on the part of the patient, as well as a ready reference to the pathological conditions in the mouth. A financial statement forms no integral part of such a reference card and is not one of the things of which we want to remind the patient, at least while in the chair. Appointments for the next sitting may be noted on these cards in the presence of the patient, and then be checked off when kept.

"The filing of these cards is not alphabetical, but by months (or by days of the month, if so desired). An appointment having been kept, the card is filed in the month

or day of the month when the patient is next to be given treatment. As the end of the month is reached, the month index card is moved to the back of the file, thus bringing forward the cards of those to be seen the following month, who will then be notified of the impending visit. Patients' cards are only moved back in the file after the treatment. Hence at the end of the month the cards of those patients who have failed to keep their appointments for any reason will be found at the front of the index, and will remain there until properly disposed of.

"The method of notification of the patient will depend partly on the patient, but the initiative in making appointments can seldom be left to the patient if good results are to be had. A notification and appointment card sent by mail is usually the best method, although with many patients the telephone accomplishes the same end with less friction. The patient should be given to understand at the time the case is started that the dentist proposes to send an appointment. If this procedure does not meet the approval of the patient, the matter can be talked over at the time and the need of such action explained, thus settling the method of notification to be followed for that patient, and avoiding possible disagreeable incidents later on. The following is the text of the card used by the writer. (Fig. 71.)

Dr. John Oppie McCall begs to suggest the advisability of making an appointment for a prophylactic treatment. Experience has shown that short sittings at regular intervals are necessary, that the improvement secured by previous treatment may not be lost. Your case having been undertaken, responsibility for its success dictates this reminder.

Time has been reserved for you at----------o'clock ----------.

FIG. 71. NOTIFICATION CARD USED BY DR. MCCALL.

"With this is also enclosed a regular appointment card, which can be tucked in purse or pocket to refresh the patient's memory.

"The method of recording pathological conditions has been developed on the basis of the needs of the general practitioner, but can be used quite as readily in a practice devoted to this field.

"The system was suggested by Dr. A. D. Black, but has been considerably modified by the writer. The underlying idea is to have a key of numbers or letters, which through their various combinations may serve to indicate and diagnose various pathological conditions.

"The chart shown here is printed on a 5x3 card, but a larger one may be used, if desired, with correspondingly larger chart. The diagnoses are recorded on it in the spaces indicating the location of the conditions recorded, by means of three letters which tell the tissue affected, the cause of the trouble, and the result shown at the time the examination is made. The three letters refer to the three columns of the key, the first letter referring to the first column, the second letter to the second column, etc.

"The key letters take up very little room, yet make as complete a record as one written in longhand. The key is readily memorized, and hence records are instantly available. The reduction of records to a key system has another advantage; namely, that it is not known to the patient, and the dentist is thus spared the necessity of explaining the edges of fillings and crowns, etc., for which some colleague is responsible, and which may have caused some trouble.

KEY TO DIAGNOSIS OF PUPAL AND PERIDENTAL LESIONS.

Pathological Condition in	Cause	Result
A. Pulp	A. Caries	A. Active hyperemia
B. Gum Margin	B. Lack of insulation	B. Passive hyperemia
C. Pericementum	C. Traumatic injury	C. Tubular calcification
	D. Denudation of root	D. Secondary dentine
	E. Abrasion	E. Pulp stones
	F. Salivary calculus	F. Hypertrophy
	G. Serumal calculus	G. Stasis
	H. Lack of contact of teeth, fillings, etc.	H. Infection
	J. Improper contact of teeth, fillings, etc.	J. Putrescence (pulp canal)
	K. Mal-occlusion (other than above)	K. Pericementitis
	L. Improper margin of filling or crown	L. Abscess (incipient)
	M. Improper restoration of occlusal surface	M. Abscess (with sinus)
	N. Mouth hygiene	N. Recession
	O. Systemic disturbance	O. Denudation without recession
		P. Pyorrhea
		R. Looseness
		S. Elongation
		T. Bone absorption without denudation
		U. Sensation

"Thus ABD indicate a pathological condition of the pulp, due to a filling without proper thermal insulation, resulting in formation of secondary dentine. BFN indicates a lesion of the gum margin due to salivary calculus, resulting in recession. CKP indicates a peridental affection caused by mal-occlusion resulting in pyorrhea. This key can be made to serve for quite a complex diagnosis, as for instance in the case of hyperemia of the pulp due to denudation of a root in the course of a progressing pyorrheal affection. The diagnosis of the pyorrheal condition will be noted as above, and the pulp trouble will be recorded thus A.PB, the period indicating that the last two letters are taken from the last column, the one indicating cause of course preceding the other. In case two causes are found, as is not uncommon, the letters will be included between two periods, as C.JN.A. This indicates a peridental disorder due to improper contact of teeth and improper care by the patient, resulting in hyperemic condition.

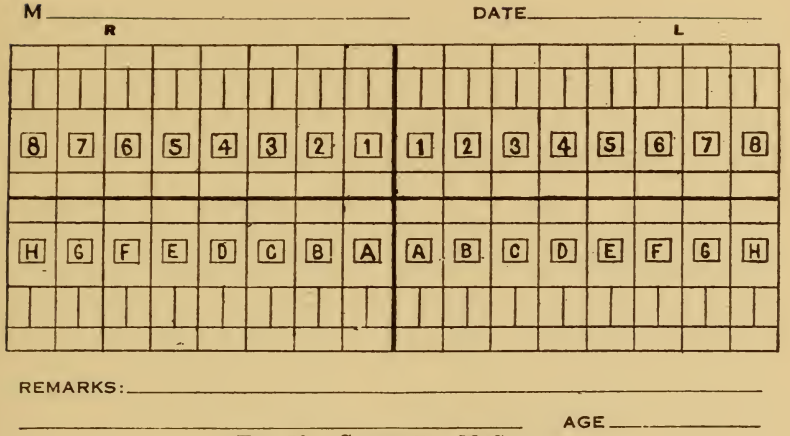


FIG. 72. CHART B. MCCALL.

"On the chart, the teeth are indicated by numbers for the upper, and letters for the lower, the same number or letter indicating the corresponding tooth on either side of the median line. (Fig. 72.) The right upper cuspid is 3R, the left lower first molar is FL. Again the key is readily memorized, and is the most compact way of designating the teeth in recording various operations. The chart shows a series of square and oblong spaces which represent the hard and soft tissues. The left-hand teeth are found at the right of the median line on the chart, this being their position in the mouth when the operator faces the patient, and vice versa. The little squares containing the number or letter represent the occlusal or incisive surfaces and are surrounded by a space representing the buccal, mesial, lingual and distal surfaces of the teeth. In this space are recorded diagnoses of pulp troubles, and also erosion, cavities, etc., of which a permanent record is to be kept. It is not intended for a record of operations performed. The horizontal oblong space at the top of the diagram represents the labial gum tissue, and notations in regard to that tissue or the corresponding peridental membrane are placed in it. The vertical horizontal spaces under it represent the mesial and dis-

tal soft tissues, and the horizontal oblong just above the heavy center line indicates the lingual gum tissue. The position of these spaces are reversed for the lower teeth. See section of chart enlarged." (Fig. 73.)

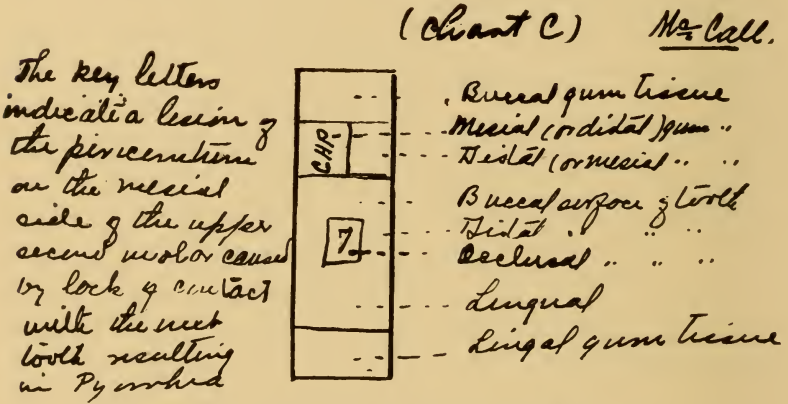


FIG. 73. RECORDING CHART OF DR. MCCALL.

NOTIFICATION SYSTEM OF DR. HENRY A. KELLEY.

"My system of notification is very simple. We will consider that a patient presents himself for work and we wish to get him on to the system of prophylaxis. I give him a talk along the lines of preventive dentistry and explain the theory of prophylaxis. Having obtained his permission to put him on this system I give him a treatment and dismiss him, having first inquired as to what days of the week are best for him for appointments and what hour in the day is preferred. I tell him I will notify him when I want to see him again. After he has gone, my secretary first enters him upon the list of my patients who are on the prophylactic treatment. I tell her how long a time I want to elapse before he has another treatment and she turns to my appointment book and enters his name as near that time as she can, considering his wishes as to day of week and hour. Then a few days, say a short week, before the time of his appoint-

ment my secretary calls him up by telephone and says, 'You desired Dr. Kelley to send you an appointment for your prophylactic treatment about this time. Now Dr. Kelley has reserved the time on such a day and such an hour for you. Will this day and hour be agreeable to you?' If he says yes, the appointment slip is mailed to him. This *must* be done to avoid the *uncertainty* of the telephone and to impress him with the importance of the appointment. Should the time reserved prove to be one not possible to him, some other appointment for prophylaxis made for some other patient, not yet notified, can be offered and his time exchanged with that patient. This is done, of course, as the secretary telephones. You will readily see with many prophylactic patients on your book you have great latitude this way.

"This is all there is to the system, except, if you have to rely upon the mail alone, you must have some system in which you get a return answer to your appointment when first sent, to know that your patient receives the appointment and to prevent loss of time owing to failure of patient to *receive* your appointment when sent. It is impossible to fix the blame for this kind of a slip-up and *you* have to assume the *loss*. One thing you have to be careful about, is that you do not in some way *break* this system. Any system is defective in that you may *think* it is working when it is not. So once in a while it is well for your secretary to check up the patients that are on the list of those having the prophylactic treatment and see that they are *all on the appointment book somewhere.*

"I believe that the dentist should always look out for the patient and should send for him when he thinks he should make a dental call and it should not be *left to the patient* to decide when he will call upon the dentist. This system of notification for prophylaxis gives you the means of educating your patients along this idea."

SYSTEM USED AND DESCRIBED BY DR. GILLETTE HAYDEN.

"Notification of Patients.—The name, address, and telephone number of a patient beginning the regular monthly treatment are placed on a card, and the card, after having the date of the first treatment entered on it, is placed in the file box one month in advance of the date of the first treatment. For example: The patient has the first treatment January 3d. The notification card has this date entered on it, and is then placed in the file box back of the month card of February and date card of 3. On January 31st or February 1st the assistant takes all cards bearing date of February 3rd, calls each patient by telephone, and arranges the hour for the appointment.

"In every case this has proven the most satisfactory of all methods tried. The patients find it easy to arrange hours which do not conflict with other appointments which they must make, and I find less disturbance from appointments cancelled or changed to other dates. Another feature of this method is that the appointment book will have only two or three days in advance filled completely. This permits of opportunities to supply time not too far removed, to out of town cases, to emergency and other cases.

"Out of town patients are notified by mail a week in advance that they are due on such date, and that an hour (usually that given on the card as the most convenient for them) is reserved for them on two different days. They make the selection of the day in the reply.

"Charges.—Charges are made for each treatment. To those having an account, statements are mailed every six months.

"Technique of Prophylaxis Treatment.—In the usual cases presented each month for treatment the buccal, lingual and liabial surfaces of the teeth are reached with S. S. W. Scaler No. 3, or 6 and 7 (from set of eight). The mesial

and distil surfaces are reached with Smith files Nos. 13 and 14, or Townes Files 33 and 34, or 35 and 36, or with Nos. 1 to 8 of the Bates' Scalers, according to the size of the inter-proximal space and the extent of the recession of the tissues.

The cleansing powder is carried to the tooth to be polished on a wedge-shaped orange-wood stick dipped first in phenolsodique. A straight large sized orange-wood stick is used where the surfaces of the teeth are accessible to it. A wedge shaped point carried in the right angle porte polisher is necessarily used on all surfaces not reached by the straight stick. Wherever the loss of the tissues permits the use of a small wood point on the approximal surfaces, these portions of the teeth are polished in the same manner as the other surfaces.

"Ribbon floss, X size, charged with the abrasive, then passed between the contact points and carried up just under the free margin of the gum and with a sliding motion of the fingers carrying the floss the approximal surfaces are polished. With an aseptic dental napkin wrapped about the index finger and charged with fine polishing material, the final polish is given to the teeth, and a light massage to the gums.

"A spray containing a zinc chloride solution is used to complete the treatment.

"Sticks are prepared by first sharpening them to a wedge shape on a very small plane set (plane side up) in a vise, then rounding the corners and smoothing off with sandpaper."

METHOD OF DR. GRACE R. SPALDING.

"You ask for methods of notifying the patients. I make out my appointments at the beginning of each year, and as usual there are not many changes because I try to accommodate my patient at first by giving him an hour when most agreeable to him. If his work is such that a regular appointment is impractical, I call him on short notice when

I happen to have time for him. The majority prefer, of course, to have a regular hour each month. The month is considered in four weeks, taking the first Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, regardless of date. The first Monday at nine o'clock belongs to Wm. E. Smith, Sr., whether it comes on the 1st or 7th of the month, as long as it is the first Monday, etc. That leaves the extra dates beyond the 28th: at the end of each month—29th, 30th and 31st, for extras and taking care of odds and ends if one has or rather wishes to have all of his time for strictly prophylaxis work. It is easy for a patient to remember, for instance, the second Friday at ten o'clock. We send out appointment cards for all appointments in the practice, and the dentist's name is sufficient explanation as to what the appointment is for, since I do not do any operative work."

In revising this part of the book several dentists were asked this question, "What progress did Prophylaxis make last year?" The answer of Dr. H. A. Kelley is as follows:

"The Prophylaxis in which I am deeply interested is almost, if not quite, a *fixed science.* Of course, there are many developments from *this* Prophylaxis that have many new sidetracks, but that is another story. To take a child from five years old and so treat him and his mouth that he shall be free from dental caries, that is our problem. We have to find the man or woman who can so preach the gospel that the people will listen and believe. When they do this, we will show results. See what Wallace has done with the fifteen children whose parents he made believe in his theories. I am doing some good work with a few children in my care. If parents, dentists and children all did all they know should be done, we could accomplish *much.*

"All that we, as dentists, can do for these children is quite simple and very well understood, and not very *sensational.* Therefore, it does not attract attention as the sudden awak-

ening of dentist and patient to a Pyorrheal condition. However, there would be no Pyorrhea in a generation if such men as you and I could have our way with the young children, and I venture the prediction that the only cure that will ever be found for Pyorrhea is never to allow it to begin.

"Now, as to any progress in prophylaxis in this *narrow* sense: We have laid down the fundamental principles, the mouth must be in order, it must be kept in order. We have given a system for keeping the mouth in order. What more can we do? I do not see what improvement we can make in our system."

CHAPTER XVIII.

RESULTS OF PROPHYLACTIC TREATMENT.

The various arguments brought forward against the monthly system of prophylaxis will not have any weight with anyone who has observed a patient who has been upon this system for a while. Six months treatment will change the whole appearance of the ordinary mouth.

1st, The mucous membrane will assume a normal pink color, not only around the buccal surfaces of the upper teeth but in every part of the mouth.

2d, Teeth that disfigure the face can be improved in appearance, for, if their surfaces be brought to a high state of polish, and the surrounding tissues healthy, one does not notice so much their ill shape.

3d, Many defects in the teeth can be worked out, white spots removed, and grooves smoothed out.

4th, Hypersensitiveness of the cervical margin and irregularity of the nerves can be corrected.

5th, Decay is prevented.

6th, The vital structures within the tooth, and those surrounding it, especially the peridental membrane, are maintained in normal condition.

7th, The mouth is safeguarded against violent infections.

8th, Osseous structures are protected from the irritation of deposits and infection.

9th, Pyorrhea is positively prevented.

10th, Last, but not least, the greatest result in prophylaxis is the aid, training, and maintenance by the patient at home, of a perfect dental toilet technique.

If it were always possible to place the mouth in a perfectly clean condition as to caries and fissures, and the patient

carried out the instructions for care of the teeth at home, we would be able to demonstrate in every case that "Clean teeth never decay." Unfortunately this is seldom the case, and we are often humiliated in our prophylaxis by the discovery of a whiteness showing through the enamel, giving evidence of the carious condition underneath.

It is well to explain to patients, before placing them on prophylaxis, in regard to the claim that prophylaxis prevents decay, that some slight carious condition may possibly develop during the first six months or year; that in the interproximal surfaces, between the molars and incisors, the etching of the enamel may have proceeded so far that it will be impossible to prevent further decay. It is not always possible to find these at once as they sometimes do not develop for six months or a year after the patient has been placed on prophylaxis.

In my experience of about ten years in prophylaxis, I do not recall, in any of these regular patients, a decay beginning out in the open, that is, on a surface where it was possible to maintain a polished surface. Many teeth with deep sulci and grooves may decay in spite of all the prophylaxis you can give them, because it is impossible for the dentist or the patient to keep these depressions in a perfectly clean state. It is the best policy to fill these either permanently or temporarily, as explained in the chapter on technique of prophylaxis.

In regard to the prevention of pyorrhea, I can say that in my own experience not one has shown the least tendency to this disease. Others who are doing this same work have observed the same thing. Of course, this does not take into consideration the patients who had pyorrhea at the time they began prophylaxis.

As evidence for my own satisfaction of the fact that prophylaxis really does prevent disease, I selected pages at random from my records, which give the amount of dental

work required by patients in the five years before they began Prophylaxis in comparison with the amount of work they have had done since. I included in these statistics such restorative work as fillings and abscesses. For the sake of comparison with this, another table was made of dental work done for patients of about the same class and mouth condition as the patients who had been on prophylaxis.

These tables show that the patients who have been on prophylaxis have had little or no dental work done since entering upon this system. The second table suggests that, had these first-named patients not entered upon a system of prophylaxis, their dental requirements would have been like those named in table No. 2, with their constantly recurring dental bills. In addition to this, all these prophylaxis patients report fewer doctor bills, and their illness, if any, has been light in character; also they have derived much pleasure from the knowledge that their mouths were in a healthy condition and their teeth in a beautifully polished state. Of as much interest as all the above results is the pleasure derived by the operator who sees the accumulative effects of his work, bringing unkept mouths into a healthy state. I have seen prophylaxis patients so that you could tell them across the room, when they smile, by the brilliancy of their teeth. Also the satisfaction of having people say, "Why, she must be a patient of Dr. ———, for her teeth are so clean looking and pretty."

The gums of a patient on prophylaxis should become hard and pink, and should hug the teeth closely. In other words, show a condition of perfect health. The fillings, which ordinarily would show rough margins and surfaces, should present the appearance of having just been inserted; and, after the patient has been on the treatment long enough, all surfaces should exhibit a luster which reflects the light.

CHAPTER XIX.

SOME IMPORTANT OBSERVATIONS ON THE TEETH AND SALIVA.

TOOTH ENAMEL.

Pickerill, and others, who have studied the histology of human teeth, have shown that the enamel, as laid down in the formation of the tooth, may contain defects, as well as fissures, and unclosed rugae. This, of course, favors decay by the retention of carbo-hydrates in the form of food stuffs, with the final development of micro-organisms. If we examine any mouth which is subject to a large number of caries, we will find that the enamel contains some break on its surface, which defect, while small, is sufficient to retain food and allow it to decompose.

Dr. Head is authority for the statement that the enamel of the teeth, which has become decalcified in weak solution of lactic acid, or orange juice, even to the point of losing its opacity, will be quite restored when subsequently immersed in saliva for some time. While this seems rather hard for us to accept at first, thorough chemical investigation seems to bear out this experiment and gives us a clue on which to build our future prophylactic technique, and mouth wash formulae. There is no doubt that the enamel of the teeth varies in structure, hardness, density, permeability, and solubility, and that we must recognize the fact that a large part of this departure from the normal must be due to developmental as well as acquired defects. Taking this view of the matter, our prophylactic treatment must be directed towards the enamel in its formative period in order that the proper osmosis of the lime salts and phosphates shall take place.

Rose, Bunge, Malcolm, and Pickerill have made exhaustive experiments in an effort to determine whether or not the enamel of the teeth could be influenced by the drinking of water heavy with magnesium or calcium salts. Their results showed that the structure of the teeth is not influenced to such an extent as are the other bones of the body. Their conclusions were that the hardness of the water was not naturally or essentially a factor for us to consider.

ON SALIVA.

Saliva in the normal mouth varies in character from a thin watery consistency, copiously discharged, to a thick, ropy, tenacious consistency such as we often see in unclean mouths.

It is unfortunate for the dentist that the analysis of the saliva is so complicated. If some simple method could be devised so that every operator could make these tests, we would probably have some interesting data.

We know that even so simple a diet as rice will give more nourishment than the human system can use and that even on this simple diet, the saliva contains its normal amount of inorganic salts. Do certain foods exert any special influence on this secretion? If not, is it the condition of the mouth, teeth, and gums which alters the character of the saliva, instead of the food?

If it were convenient to test the saliva of each patient we might have more data on the etiology of the disease, and be in a better position to effect a permanent cure. For instance an analysis might show an abnormal amount of phosphorized fat which would direct our attention to the liver. Intestinal fermentation products have been found in the saliva, e. g. indican. Auto-intoxication from the intestines may be so great that the kidneys are unable to carry off the material, and we may find in the saliva test materials

which would direct our treatment toward the establishment of a physiological process of metabolism.

Some writers have endeavored to show that the lessening of the quantity of the saliva is responsible for an excessive amount of dental caries. So far as I have been able to observe clinically, the question of quantity is not of so much importance. Recently, I was baffled in the case of a young married woman, who, when excited or nervous, suffered from temporary stenosis of all the salivary ducts, so that the mouth was almost as dry as though she had been taking atropin. So great was the pain sometimes caused from this condition that the patient became very despondent. As the mouth and the surrounding structures were in a perfectly normal state, I and my medical associates were at first unable to find any indications for treatment or to afford the patient any relief. We began to treat her for a trouble far removed, and one which at first we thought had no connection with the condition of the mouth, for we supposed that getting her mind off her mouth conditions would at least give her some degree of comfort. She improved for a time under a physician's care but later passed out of our observation. The point, however, is that while the patient's mouth was dry, she did not exhibit any considerable amount of carious condition of the teeth.

It has generally been noticed that where a pyorrheal condition is present, we have an increased supply of saliva, yet there is often noted a total absence of caries. In the mouth of the case described, there was a reduced amount of saliva, yet the mouth showed only a small amount of care. My observation, while based upon a large number of cases, does not allow me to say with any positive degree of certainty that caries are influenced by quantity of the saliva, still I am of the opinion that the presence of some element in the saliva, as well as the quantity of the solution, must be looked for as the prohibitive agent.

Of course, we must realize that stagnation of any secretion must result in decomposition or putrefaction, and that this will contain some degree of infection, but I am forced to believe that it does not have as much influence as Pickerill would have us think.

It is a strange law of nature that the quantity of the saliva is not increased by the drinking of ordinary liquids. You can have the patient with thick, ropy saliva drink large quantities of water without perceptibly influencing this condition. However, stimulants do produce vasomotor effects either as a stimulant or a depressant. Tea is given as the greatest depressant, while acid fermented liquor, as port wine, produces the highest alkalinity index.

The conclusion which I wish to lead up to is this. It does not matter what the condition of the saliva is, nor the quantity, nor the quality. What we are most interested in is to note that the patient with an abnormality of the saliva has a much better chance for a return to the normal or the physiological condition when on regular prophylaxis.

Pickerill has made considerable study of the composition and behavior of the human saliva, and from his writings we have the following deductions: On the degree of excitability of the various glands which furnish the saliva, he has found that the ordinary tasting of foods does not excite the glands to action and that "bread and butter depress the secretion." In his table of experiments from bread and butter at 1.73 alkalinity per minute, he runs the list of pineapple, cake, grapes, celery, meat, stewed apples and up to lemon juice which is 6.24. Also, it is shown that the alkalinity of the parotid saliva is greater than that of the other glands, although these glands furnish only a small quantity of the secretion. It is a most beautiful and wonderful provision of nature that, whatever the degree of acidity in the food products, the proper alkalinity is furnished by the saliva, although the acid food may be so strong that it could

etch the enamel surface of the teeth, as in the case of the Silesians, who suck lemons for a pastime. The after flow contains sufficient alkali to neutralize the acid, and the question of alkalinity is one of the most important with which we have to deal.

PTYALIN.

Physiologists teach us that the action of ptyalin in the saliva is for the purpose of converting the starch into sugar, in order that the sticky or solid material may be changed into one soluble and ready for absorption. We are led to believe that ptyalin has more to do with mouth conditions than this.

The operation of extirpation of most of the salivary glands has not resulted in any difference in undigested starch products. In order to prove this, Pickerill selected two rabbits, A and B. One was kept as a control while the other one had the parotid and submaxillary glands on both sides removed. Weeks after the operation feces were collected at intervals, and the examination showed no difference or a very small difference of undigested starch. Pickerill suggests that the function of ptyalin is not as heretofore supposed, but rather, for acting upon the carbohydrates remaining, or debris left around the teeth, to be used after the process of digestion in the intestines has gone on.

SULPHO-CYANIDE OF POTASSIUM.

Another substance in the saliva which has been the subject for much speculation is sulpho-cyanide of potassium. Some thought that by increasing its quantity we would gain some protection against caries, and yet, Ellenberger and others have demonstrated that this substance is not found in many animals which are immune to caries. Some authors, as Neuchael, Lowe, Beech, and Geyger, are of the opinion that some salt of this substance, administered inter-

nally, might in some way produce an inhibitory action on dental caries. However, Miller and Kirk have exactly the opposite opinion. About all we know is that a weak solution of sulpho-cyanide of potassium possesses slight antiseptic qualities. Experiments show that the percentage of this drug in the saliva can be increased by the internal administration of one fourth of a grain daily, and the suggestion is given to try this in those cases where children's teeth are being destroyed by caries. It is doubtful whether any direct good will result but it appears to be worth giving a trial.

PHOSPHATES AND CHLORIDES.

Phosphates and chlorides undoubtedly increase our desire for a certain class of food and drink. For instance, if we rinse our mouths with a mild solution of sodium chloride we are enabled the more readily to taste sweets.

MUCIN.

This substance seems to have only the function of a lubricant or protective covering for the mucous membrane. Unfortunately, it is also precipitated around the teeth and, instead of being a protection, forms various kinds of plaques. Into this precipitation is caught the food products which in time cause the development of caries.

POSSIBLE PRESENCE OF IMMUNE BODIES IN THE SALIVA.

Miller suggests that phagocytes or protective bodies may be present in the blood. However, the presence of phagocytosis has not yet been established. If this is ever done, it is possible that opsonins in the saliva and the raising of this index will become just as potent a factor in dental prophylaxis as it has proved in raising the immunity against certain diseases.

The result of all this investigation gives us very little knowledge which we can use in our work of preventing decay. This much we do know, that organic acids increase the alkalinity of the glands, and, conversely, neutral salts produce diminution of the protective substances which we wish, and that if we remove oral sepsis, by a system of prophylaxis, the saliva can be made one of the greatest aids in keeping the teeth clean, because, in a proper condition, it acts by constantly washing the teeth and surrounding parts, giving the patient the most ideal mouth wash, nature's own make, which formula has not been equalled.

CHAPTER XX.

TRAINING OF FEMALE ASSISTANT.

TIME FOR INSTALLING ASSISTANT.—WHERE TO SECURE BEST HELP.—OFFICE TRAINING FOR THE POSITION OF DENTAL NURSE.

TIME FOR INSTALLING ASSISTANT.

When the author first came to Atlanta fifteen years ago, there was only one white female assistant in a dental office; several dentists had negro girls. Shortly after this some of the dentists began putting white girls into their offices but were criticised for it. To-day, such a revolution has come about that every office of any reputation has from one to three young ladies employed. Even the term "office girl" has now disappeared, and each young lady has her special duties to perform, and is entitled to the name of assistant, secretary, bookkeeper, or dental nurse.

To the student who is soon to start a practice, to the young man already graduated, or to the older practitioner who has not availed himself of this great help, these pages, I hope will be of assistance.

The first question which naturally arises when the subject is brought up is, "When should such help be installed?" In answer to this, I should say that just as soon as the office is established, and the patients begin to make their appearance, then should the training of the assistant begin. In other words, I consider the trained female assistant just as necessary to the dental office as the chair or the engine.

WHERE TO SECURE BEST HELP.

The next question is, "From what source is such a girl to be obtained?" The advice that I give my students in a

rather semi-serious mood is that they insert in the daily newspaper exactly the description of the girl they desire, withholding, of course, their own name and address; the office will probably be flooded with applications. If they meet these pleasantly, they have placed an advertisement in just so many homes from which they may receive future patronage.

The scheme, however, which I employ, is to go to the floor-walker in some department store and explain to him exactly my needs. My reason for this is that in his daily watch over a large number of young ladies, of the class from which we must employ the ordinary dental assistant, he has the chance to pick out the one to suit the position. If you explain to him that it is a regular position, and one where advancement can be expected, he will frequently tell you of some young lady in his employ, with whom, for the sake of allowing her to take the better position, he is willing to dispense, or, if he is not so inclined, he will generally tell you of some one, formerly employed by him, who will come up to the requirements. I have always found the girls endorsed by the floor-walker to make better employees than those secured from other sources. I have also found that applicants from newspaper advertisements and employment bureaus have often not been able to furnish the proper references.

In making your decision as to the fitness of an applicant investigate her references. If she can give the pastor of her church, you may generally put it down that this counts. Always prefer one who lives at home, or with her relatives, or one who can give good reasons for not living at home. Give the preference always to the older applicant, other things being equal. The girl under nineteen years of age has no place in the dental office.

One thing that must be guarded against is the good looking girl. In my own experience, as well as that of others, I find that such a girl is not the proper applicant for the posi-

tion of dental assistant or nurse. Not that beauty itself is a detriment, but rather, it is of such charm that you will either have your patients talking about the good looking girl in your office, or it may soon lead to her taking a matrimonial venture and your assistant is lost to you as soon as she is trained.

Explain to the applicant that it will take several years of training before she can expect any considerable advance of wages. From the very first, it is best to have this understood. I have noticed that the dentist who employs a young lady and fails to have this understood at first, soon finds that the girl is trying to run the whole office. He has made so many promises that her wages have to be increased before the dentist's income is sufficient to warrant it.

The first duty of the female assistant to the dentist is that she, being a good housekeeper, keep his office in order. This must be understood before she enters the office as assistant. No matter what her qualifications are, if she is not willing to go into the office, and, if needs be, scrub the blood from the floor after an operation, she is not the one for him. She must be willing and able to keep the office in order and in a clean state for, although our buildings have janitors, they do not clean the cabinets and wash stands. Many times she will be called on to clean the basins and the spittoons after a bloody operation.

The young lady should be given a key to the office, and, at least half an hour before you arrive, should open up the office, dust it, and turn on the heat. In other words, have everything ship-shape on your arrival, so that without further delay you may proceed with the patients.

In regard to her dress, I would advise that you make some distinction or difference from the ordinary dress. Now this will have to be understood at the time she takes the position for, if you wait several months, you will find that she is not willing to change. Many girls of this class wear gaudy jewelry and gay costumes. You will have to explain

to them that they are in the same position as the trained nurse and must wear simple clothing. It is better that she wear nurse's costume or some part of a nurse's uniform.

If you have secured the services of the proper young lady, and you can not secure this proper applicant on a salary of less than $6.00 per week, this amount will be well spent, and she can save the dentist's time, and time is money to a dentist. In addition to this, she is in a position to add to your reputation, because she will talk your business better than you can yourself.

As the majority of dentists do not employ but one young lady, I will describe some of her probable duties which she will have to perform and in which she can be of real assistance to the operator. It will be best not to try to teach her the names of the instruments the first week, but try to teach her the use of the telephone. I would suggest that the dentist himself not answer the telephone at all. Dr. Kells, for example, will not answer his telephone during office hours. There is a good reason for this. These telephone messages are often for the purpose of breaking an engagement, objecting to an account, or complaining about work. In making engagements over the phone, you are never able to tell just how much time to leave out for such and such an operation. It is much better for the patient to come to the office for an examination. This engagement can be made by the assistant. It is a great advantage to have provided a special telephone record. The sheets should be about 6x8 inches and padded. One sheet should be used for each day. The assistant should accurately record in one portion of the sheet all incoming messages. On another section all outgoing messages. Thus the dentist may know at the end of the day what has gone on over his phone without being bothered all through the day. At the end of the day he may sit down at his leisure and attend to each call. When the assistant makes engagements, I would suggest the following line of conversation:

"Yes this is No.——— Dr.———————'s office. What name, please? Yes, he is here, but engaged in an operation. It will be a favor if you will give me the message as I make engagements for him." The reason for this line of talk is that it impresses the patient that you are busy. If the person at the other end of the line refuses to give the message, the following reply should be made, "Leave your number and I will have the Doctor call you later." If the message is delivered, it should not be delivered to you verbally but written on a slip prepared for phone messages. This gives you time, also, to frame the proper answer. If an engagement is to be made, the engagement book is taken to the telephone. If a bill is in question, you may take the ledger to the telephone with you.

Have it distinctly understood that your telephone is for business, and not for the young lady to talk to her gentleman friends, for some day while such a flirting conversation is going on, a patient suffering with a toothache will call some other dentist, not being willing to wait until the conversation is over.

It is best to have the assistant make all engagements which must be recorded in an engagement book. If made over the telephone, it should be verified immediately by mailing a card to the patient. This will save many lost hours.

She can make all bank deposits. She should be instructed how to write a receipt and to receive money from patients while you are busy.

She must be instructed how to handle the patients in the parlor, especially the waiting ones. She must be able to explain to them that the doctor is engaged in a difficult operation, and, in justice to the other patient, they must wait patiently. There is one thing which she must not talk about and that is what is going on in the operating rooms. She must be, so far as talking to the patient on this subject is concerned, a blank. Especially will she be questioned as to

the Doctor's fees. *She is supposed to know nothing along this line.*

As I have said, she must be a good housekeeper. It should be her duty to see that the janitor sweeps down the walls, that the mirrors are polished each morning, that the laundry is not full of holes, and that it goes out regularly and comes in on time. She should have the purchasing of the towels, napkins, and linen, as she knows more about such things than the dentist. One of the hardest things, I find, is to get the assistant to keep an accurate laundry list, and I consantly find myself buying a new supply of linen. I find it a good plan to buy ordinary duplicate order books, and insist that the quantity of each article be put down, and that a duplicate sheet be put with the clothes ready for the laundry, then, that this slip be checked before receiving the clean linen.

If she is to be of value in assisting around the chair, she should have the quality of seeing ahead, that is, of anticipating the needs of the dentist. In other words, the dentist should not have to tell her everything to be done. The minute the patient sits down, she should put a protecting napkin around his neck, and place a cup of some antiseptic mouth wash near at hand. She should see to it that the chair is comfortable. This done, she should step aside.

I have found it better not to keep up a line of conversation with the assistant. If a code of signals can be arranged, you will find it of advantage, for, sometimes, you will want her to go out, and to tell her to go would defeat your purpose. One tap of the instrument could mean for her to stay, two for her to retire.

One of the most valuable adjuncts to my office is the use of a card, as shown below (Figure 74). As soon as patients arrive they are furnished this card by my female assistant. She sees that it is properly filled out before bringing it to operating room where it is placed in a special holder just

next to my cabinet, without disturbing me, yet where I can see the full significance of the waiting caller at a glance.

KINDLY WRITE NAME AND ADDRESS
AND CHECK YOUR CALL

Name .....

Address.....

Wishes to see

- O **Dr. Robin Adair**
- O **Prophylaxis Assistant**
- O For Examination (Fee $1 to $5)
- O To make engagement
- O Have engagement
- O Business call
- O Social call

Memorandum .....

.....

.....

.....

1 2 3 4 5

FIG. 74. On arrival callers are furnished with this card by the secretary. As soon as filled out, the card is placed in a special holder before the proper operating chair.

This enables one to know the caller's name and address, saves introduction, and a lot of questions. If the check is on second item, then the assistant makes the engagement without disturbance. I have never yet had a book agent check anything except the business call, and all of these checks are requested to call after office hours. The numbers at the bottom denote the number of patients waiting before the last one came in. This card enables the assistant to handle a large number of callers without disturbing the dentist.

At the end of the day these cards are taken and all work done for each is figured out. I have their correct address which may be new since my last work.

Other duties for a female assistant are suggested under the head of Dental Nurse. Many of these can readily be taught to the average female assistant.

If, perchance, you can employ a young lady who is a stenographer and bookkeeper, you are indeed fortunate, for there is nothing more needed in the modern dental office equipment than careful work along this line. While you will have to make the original entries of work done at your chair, she can afterwards record them in the dental ledger. At the end of the month, she can save you a great amount of time by making out the statements.

I have always found that a young lady, calling up a patient for a delinquent bill, saying that she is bookkeeper for Dr.————, and that it is time for closing up the books, and she, finding that the bill had not been paid, would like to send around for it, does more good than putting a lawyer after them.

Some dentists have their bookkeeper look up the financial rating of a new patient when he first presents himself, so that she can hand the dentist, written on a sheet of paper, just what to expect in the way of payment. Even the information given by the city or telephone directory is most valuable at this time.

OFFICE TRAINING FOR THE POSITION OF DENTAL NURSE.

If the dental nurse has been trained up from the dental assistant, she probably knows the patients and has their confidence and you will have less trouble in introducing this line of work into your practice. It is to be hoped that by the time this book is published, some school will have taken advantage of this opportunity by putting into its curriculum a course of training for dental nurses. As the question will

be taken up more fully in the latter part of the chapter, it suffices for the present to give some suggestions to those who wish to train their own assistant for prophylaxis. Some simple rules may be of help; in the first place, it will not be advisable to call the assistant a dental nurse until she has had a degree of training and has become somewhat efficient. The first qualification is that she have some aim in life, and be of settled disposition, for the girl whose future is in doubt has no place in this work.

I would begin the training by placing at her disposal some of the simple books on sterilization as given for general surgery. She should be first aid in minor surgical work and should assist the dentist in administering anesthetics. In the first place, it is an absolute necessity that the assistant be present when giving an anesthetic, and that she be taught along this line, for many is the time that the assistant gets excited more than any one else. I would let them read the small book of lectures by Dr. De Ford. In this way, they will receive the knowledge of what is expected of them under such circumstances.

The anesthetic having been determined upon, if the patient is a woman, the dentist steps from the room and leaves the patient in the hands of the nurse. The nurse sees that the corset is either loose or removed, the tight collar and the neck band opened. The dental nurse can at this stage dispel the fear from the mind of the patient better than the dentist. She should put around the patient the protecting apron and have a hand spittoon within reach and a supply of towels convenient. She should be taught how to proceed in the case of an accident for, if she is not, she may desert you at a critical moment.

CHAPTER XXI.

THE DENTAL NURSE.

VIEWS OF FONES, MERRITT, HYATT, HART, EBERSOLE, NODINE, KIRK AND SKINNER.—AN ACT TO REGULATE THE PRACTICE OF ORAL PROPHYLAXIS BY A REGISTERED DENTAL ASSISTANT.—THE MASSACHUSETTS DENTAL SOCIETY BILL.

The trend of the times is toward trained dental assistants for oral hygiene work. Women now employed in this occupation have been designated dental nurses. In many offices they are successful in the field of prophylaxis, in the schools they are doing great work in the examination of children's mouths, and in the various clinics instituted in some countries they have proved superior to men for all work.

In order to show the present demand for dental nurses, the author has selected from the published views of some of the leading men in our profession, quotations on the subject which are given at some length.

Dr. A. C. Fones says: "A busy practitioner can not comfortably do this work alone, unless he limits the number of his patients to comparatively few. He must have aid, and I believe the ideal assistant for this work to be a woman. A man is not content to limit himself to this one speciality, while a woman is willing to confine her energy and skill to this one form of treatment. A woman is apt to be conscientious and painstaking in her work. She is honest and reliable and in this one form of practice, I think she is better fitted for the position of prophylactic assistant than is a man."

This view is also taken by Dr. A. H. Merritt:

"It is an innovation that has been made necessary by the evolution of dentistry. It is in the line of progress and will prevail. It may not come this year or next, but that is of little consequence, it is enough, just now, to know that it is a part of the dentistry of the future. Like all forward movements it may meet with opposition, and that from those most directly benefited, but that is to be expected. Progress has always been made in the face of opposition.

"In the very nature of things it must go forward, and co-operating with it to the end that the public shall be better served will go to the trained dental nurse."

Dr. T. P. Hyatt takes up some of the various objections which have been raised against this movement:

"The work of the nurse is to keep all the exposed surfaces of the teeth in a high state of cleanliness and polish. Please understand that when I say polish I mean the kind that is secured by the methods advocated by Dr. D. D. Smith.

"I shall make no attempt to show the need of dental nurses in our dental dispensaries or schools, for the reason that once they admit their need in our offices, it must follow that the need is great and greater in the dental dispensaries and schools.

"Up to the present I have only heard three objections to passing laws permitting dental nurses, which laws would regulate the knowledge required, and prescribe the rules and regulations under which they should work.

"1st, If you want a dental nurse take a graduate dentist.

"2d, If this work is so important it should only be performed by a college graduate holding the dental degree.

"3d, To allow any one other than a doctor of dental surgery to perform any service in the month is to lessen the value and importance of our work.

"What work is the dental nurse expected to perform? To fill teeth? To make crowns or bridges? To cut, or re-

move any of the normal structure, such as tooth structure, gum or alveolus? To treat pathological conditions and prescribe drugs? If any or all of these are required or expected of the dental nurse, then they should be graduated doctors.

"Those advocating dental nurses do not expect any of these things.

"Does any one question that the work a trained nurse does is important? The health, even the life of the patient depends upon the performance of these duties regardless of who does them. Their importance being admitted, with the realization that the success of an operation depends upon their being done, and done right, does the medical profession insist that only graduated doctors, or women who have secured the degree of M.D. be permitted to perform these important services?

"Another objection I have heard and with due reprise and astonishment that any one for a moment can believe that it is really worth considering at all. The objection is this: If we allow young women to become trained dental nurses, a great many might start dental offices of their own. It seems absurd to think that anyone could advance such an idea with any seriousness.

"Dental nurses will be of such inestimable benefit to the public, our patients, and to the uplift of our profession, that all good men should unite, and think out, and work out the best and safest plans for its accomplishment."

Dr. Chas. E. Hart, of San Francisco, says in reference to the dental nurse: "I have two with me at present and am running two operating rooms. The uniforms that costume the nurses are made of white material and of similar substance to the ordinary surgical gown, and made up in simple form with pattern to suit the person."

Dr. W. G. Ebersole, of Cleveland, says: "I find the lady graduate for prophylaxis work to be very satisfactory

indeed. This is the beginning of the ninth year in which I have employed ladies in this field."

Dr. A. M. Nodine, of New York, suggests that: "It would be a mighty fine thing for the dental profession to achieve this accomplishment for the benefit of the millions of poor school children. If the public wake up to the realization of the possibilities, importance, economy and practicability of the idea, it will establish the trained nurse in spite of either the apathy or protest of the dental profession."

Along the same line of prophecy, Dr. Kirk, by editorial in *Dental Cosmos,* says:

"Whatever objections may be urged at present against the employment of the dental nurse in the capacity here under consideration, the trend of the time appears to be inevitably in favor of such a course, and it is highly probable that the near future will see the dental nurse as firmly intrenched in her field of activity and as efficiently serviceable therein as to-day we find the usual lady assistant in our modern dental offices."

I can not for the life of me see why the dentist will undertake even the operation of filling the teeth without first using the precaution of cleaning the field of operation. I have made it a rule in my office that before I take the patients, I turn them over to my dental nurse, who, if nothing more, mops and syringes the mouth out with antiseptic solutions. I find that the patient appreciates the work more and that it lasts longer, and, surely, it is more pleasant to work in a clean mouth than in a dirty one. Then too, when I have finished the work for the patient, he is again turned over to the nurse, who suggests the proper toilet articles such as dentrifice, silk, mouth wash, etc. If the patient desires, these are furnished him before leaving the office.

It is a good idea to keep these things for sale in the office, as it gives the nurse a chance to earn part of her salary. It also gives the nurse the opportunity of instructing the pa-

tients in the manner of brushing their teeth. Few patients know this, and the dentist is too busy to show them properly, as it takes some fifteen or twenty minutes.

You will find in the case of the younger patients, that if they had to be led in to you first, would probably be afraid and hard to manage. The dental nurse can take these children for a few sittings and, by cleaning up their teeth and teaching them something about oral hygiene, will be able to turn them over to you, with all fears dispelled, for the further treatment of their teeth.

FIG. 75. A neat gown to be worn by the female assistant. This lady was Mrs. Irene Wood, who for many years practiced prophylaxis in the office of the author. She cleaned the teeth of so many visiting dentists from other cities that she was the recipient of invitations from several associations to read papers and specially by clinic and demonstrate her method of handling children. Mrs. Wood was probably the first real dental nurse in the South.

Women are particularly adapted to the work of prophylaxis in that the sense of touch is more delicate, and, just as they are willing to spend hours working on a small handkerchief, so they will be willing to work for a long time removing stains from teeth while the dentist devotes his time to other work.

There are many patients who would avail themselves of the opportunity for prophylaxis, but who are not willing to pay a dentist for his time. Thus the dental nurse enables these to have this treatment at a smaller fee, as the dentist's time is worth from $5.00 to $10.00 per hour, the nurse's is worth from $1.00 to $5.00 per hour. She can spend more time than if the dentist did all the work himself. In the course of time, the patient begins to appreciate this class of dental work, and will be willing to pay regular fees.

Several years ago when I first determined to train a nurse for some of my work I advertised, and talked with 150 applicants before I accepted a middle-aged trained nurse who for many years did the larger part of this work in my office. She first helped me at the chair, then took a course by reading everything published on the subject; she also brought in her kinsfolk's children and her friends to practice on. On regular patients I would do the difficult part and have her finish the treatment. Thus she became proficient and self-confident, while the patients were delighted with the novelty of the idea. (Fig. 75.)

DR. ROBIN ADAIR

RESPECTFULLY ANNOUNCES TO HIS PATIENTS THE SERVICES OF A TRAINED DENTAL NURSE TO PRACTICE ORAL PROPHYLAXIS UNDER HIS DIRECTION AT A MINIMUM FEE.
THE TRAINING OF CHILDREN IN THE PROPER CARE OF THEIR TEETH HER SPECIALTY.

Phone Main 2442.

FIG. 76. If you employ a dental nurse or hygienist, this card given to your patients is efficient.

A card was sent to all my patients to let them know about the dental nurse. (Fig. 76). When I saw she was a success I quit the work, except to those who were willing to pay well for my service, and sent out, as "per suggestion by Bro. Bill," another card. (Fig. 77.)

DR. ROBIN ADAIR

RESPECTFULLY ANNOUNCES THAT ON DECEMBER THE FIRST HIS FEES FOR ORAL PHOPHYLAXIS WILL BE ADVANCED.

November 26, 1909

FIG. 77. When an assistant is employed for prophylaxis, your fees should be advanced in order to put this work in his or her hands.

In regard to the dental nurse I can only say that when the proper help is secured it not only adds dignity to the dental office, but also enlarges the field of the dentist.

The dental profession has become so divided on this question that no law has yet been passed, but it must be the final solution of the great problem of oral hygiene.

Dr. H. S. Seip, president of the Pennsylvania State Dental Society for 1914 says in his address, "Owing to the mighty movement of oral hygiene, as to the inability of the dental profession to take care of the pressing necessity for the treatment of dental caries and irregularities, I recommend a change of our dental laws, so as to provide for the licensing of the dental nurse, who shall assist the dentist, and who shall also be permitted to give prophylactic or surface treatments of the teeth, etc. Suitable course of instruction could be provided by the dental colleges, and the services of these nurses utilized while they are taking the course at the chair and clinic, as are the services of the medical clinic at our different hospitals."

To those who contemplate taking a stand for the legal status of female dental assistants the following suggestions were given by Dr. F. H. Skinner, of Chicago, after a

lengthy conference with him on this subject. In view of the fact that we have no institution where instruction is given the nurses he gives a plan whereby they may be trained and legalized.

AN ACT TO REGULATE THE PRACTICE OF ORAL PROPHYLAXIS BY A REGISTERED DENTAL ASSISTANT.

(BY F. H. SKINNER, D.D.S.)

REQUIREMENTS FOR APPLICATION.

1. Application for license must be made to the State Board of Dental Examiners, and signed by a regular registered dental practitioner.

2. Party for whom application is made must be twenty-one years old and graduated from an accredited high school.

3. Said party must have had at least three years experience as a dental assistant under a licensed dental practitioner who vouches for applicant's efficiency and a certain knowledge of the few drugs and medicines used in oral prophylaxis.

LICENSE.

Upon such application being presented to the State Board of Dental Examiners, that body, at its discretion, shall issue, or cause to be issued, a license permitting the party named to practice oral prophylaxis only in the office of the practitioner who signs the application, or such place as he may request. (As a call at a home to give an oral prophylaxis treatment, in case of sickness.)

The State Board has a right to satisfy itself as to the qualifications of the applicant, as to the education, age and character, as well as by examination as to ability, and if deemed advisable, require applicant to give a clinic to satisfy itself, or it may issue license solely upon the reputation of the dental practitioner who signs the application.

FEES.

The fee for said license shall be $10.00 (ten dollars) and shall be subject to the same registration and fees as the license of a practicing dentist.

Should the party to whom license is issued leave the employ of the practitioner who signs the application, said license becomes null and void, but a new license may be issued without examination should the party enter the employ of another dentist. The object of this is to have this work done always under the supervision or control of a regular dental practitioner.

THE MASSACHUSETTS DENTAL SOCIETY BILL.

A committee from the Massachusetts Dental Society drew up and presented a bill for legislative enactment giving a legal standing for the dental nurse and the methods of control. The object of this bill was thus urged by the committee:

"The object of the bill is to secure for the dental profession the help in practice furnished physicians and surgeons. By our present dental law the dentist can not legally have this needed assistance. Even the registered nurse while doing work among the poor, can not examine the mouth of a child suffering with toothache and put in anything to relieve the child's distress without breaking the dental law. So slight an operation as tying a piece of silk or putting a piece of tape between teeth for wedging, is illegal when not done by a registered dentist. No one but a *registered dentist* may clean or polish teeth. This makes it impossible for children's teeth to be properly cared for, as the busy dentist can not devote time enough to this operation, and in order to have it done as often as needed, it becomes a financial burden for a family of limited income at the price a registered dentist must charge for his time. In the public clinic the registered dentist can do practically nothing in polishing the children's teeth.

"The prophylactic care of children's teeth is therefore not practicable with our present legal conditions. In order that the children may have this proper care, the public needs a dental nurse. This nurse need not have at present the extended training that is given a registered nurse. The training that she will receive in the training schools will give the dental profession a standard of service that we have never had. There are many young women employed in the dental offices of our State who by being trained and being registered as dental nurses would be of invaluable aid to their employers. No one need, however, employ such a nurse. The regular office assistant will be used as formerly, only she may not do the things the registered dental nurse may do, and of course she will lack the training."

A new Dental Practice Bill (1915) has been signed by the Governor of the State of Massachusetts. This Bill is of great interest to those who are working for legal recognition of the Dental Nurse or Dental Hygienist. This part reads:

"Any person of good moral character and twenty years of age may, upon the payment of ten dollars, which shall not be returned to him, be examined by said board in the subjects considered essential by it for a dental hygienist, and if his examination is satisfactory, shall be registered as a dental hygienist and given a certificate allowing him to clean teeth under the direction of a registered dentist of his commonwealth in public or private schools or institutions approved by the local board of health." (Bill No. 228, Section 3, lines 43 to 62.)

As a matter for record and to give suggestions for those who may in the future wish to propose legislation on this subject the defeated Massachusetts Bill of 1912 is printed in full.

HOUSE .... No. 1566

The Commonwealth of Massachusetts

In the Year One Thousand Nine Hundred and Twelve.

AN ACT

To amend the law regulating the practice of dentistry.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. Any person who is eighteen years of age or over and in the opinion of the Board of good moral character, upon payment of a fee of five dollars, which shall not be returned to him, may upon application be examined by the Board of Registration in Dentistry and be licensed by said Board as provided in Section six hereof to perform such service as a dental nurse as shall be specified in his license. Except as provided in Section two in this Act, the person desiring such registration shall specify in his application the name and address of the registered dentist by whom he is to be employed, and this application shall be approved in writing by such registered dentist. No registered dentist shall have at one time more than one registered dental nurse in his employment. No business firm or private incorporated dental company shall employ more than one registered dental nurse at one time, in any office managed or owned by it. Such license shall be valid for one year from the date thereof unless revoked by said Board for the violation of the conditions thereof. Any license isued under the provisions of this Section may be renewed without further examination in the discretion of the Board, from year to year, upon payment of a fee of five dollars.

SEC. 2. Any person who is eighteen years of age or over and in the opinion of the Board of good moral character may, upon application, be examined by said Board and licensed as aforesaid to serve as a dental nurse in any of the public educational or charitable institutions in the state approved by said Board, which institution shall be specified in the license, provided that this application shall be endorsed by the authorized officers of such institution. Such license shall be limited to the performance of service in connection with institutions of the character specified therein and may be renewed from year to year without further examination and without the payment of any fee therefor. Any number of dental nurses may be licensed for services in connection with any such institution. Any license issued under the provisions of this Section shall expire forthwith whenever the registered dental nurse shall cease to render such services solely for institutions of the character specified in the license.

SEC. 3. A registered dental nurse shall be licensed to perform only such duties as shall be specified in his license and solely in the office and under the direction of a registered dentist. No dental nurse shall

be licensed to perform any service other than the examination, wedging and cleaning exposed surfaces of teeth, inserting and changing dressings in teeth for the relief of pain and assisting a registered dentist during the performance of his dental operations.

SEC. 4. Any member of said Board or its agent may at any time visit any office or institution in which a licensed dental nurse shall be employed and make such examination as he shall see fit in order to determine whether the provisions of the laws regulating the practice of dentistry and dental nursing have been complied with.

SEC. 5. Any licensed dental nurse changing employers must notify the Board forthwith of such change and also of the name and address of the dentist by whom he is to be employed.

SEC. 6. Whenever by the terms of such license the holder thereof shall be authorized to perform all of the services specified in Section three hereof, and shall have the title of Registered Nurse, such holder shall have the right to use the title Registered Dental Nurse. An applicant who fails to pass an examination satisfactory to the Board, and is therefore refused registration, shall be entitled within one year after such refusal to a re-examination at a meeting of the Board, called for the examination of applicants without the payment of an additional fee.

SEC. 7. The Board may, after a hearing, by a vote of a majority of its members, annul the registration and, without a hearing may annul the registration and cancel the license of a dental nurse who has been found guilty of a crime or misdemeanor.

SEC. 8. The Board shall have power to register in like manner, without examination, any person who has been registered as a professional dental nurse in another state under laws which in the opinion of the Board maintain a standard substantially equivalent to that of this Act.

SEC. 9. The Board shall investigate all complaints of violation of the provisions of this Act, and report the same to the proper prosecuting officers.

SEC. 10. Whoever, not being authorized to practice as a registered dental nurse within this Commonwealth, practice or attempts to practice as a registered dental nurse, or uses the abbreviation R. D. N., or any other words, letters or figures to indicate that the person using the same is a registered dental nurse, shall for each offense be punished by a fine of not more than one hundred dollars. Whoever becomes registered or attempts to become registered, or whoever practices or attempts to practice as a registered dental nurse under a false or assumed name, shall for each offense be punished by a fine of not more than one hundred dollars, or by imprisonment for three months, or by both such fine and imprisonment.

SEC. 11. This act shall take effect upon its passage.

CHAPTER XXII.

TEACHING OF ORAL HYGIENE, PROPHYLAXIS AND PYORRHEA IN DENTAL COLLEGES.

PRACTICAL METHODS EMPLOYED BY THE AUTHOR.—THE RESULTS OBTAINED.—THE NEED OF SUCH INSTRUCTION.

The subjects of oral hygiene, prophylaxis and pyorrhea are receiving more and more attention each year in our dental colleges. Having taught these subjects for several years, I give some suggestions that may prove of value to those just beginning the work.

If practical, the course should be divided as follows: Freshmen receive the course on oral hygiene, the Juniors prophylaxis and the Seniors pyorrhea. In order to make the lectures of a personal character and to elicit interest, it is best to make a personal examination of the mouths of each class and tabulate the result. Call attention to any defect or treatment needed. The students should be called into a private room, one at a time, for the examination. Before final examinations another examination should be made and credit mark given for any improvement. If the lectures have been interesting, these make the work of practical value. If this is not done, or where no lectures have been given on these subjects, we find many Seniors going out with their mouths in a condition which is a disgrace to the profession which they will represent.

At the first lecture take into the hall a new tooth-brush, floss silk, quill tooth pick and dentifrice. Ask for a volunteer from the class to come to the rostrum. Give him the tooth brush with the request that he brush his teeth exactly as he practiced at home. He generally will make a poor showing. Then take the brush in your own hands and brush

the teeth correctly. See that the student can do this correctly before he leaves the stand. Then explain to the class that if a student of dentistry does not know how to brush his teeth, they can expect their patients to know less. The use of the silk and other accessories are also shown. The demonstration of the proper method of rinsing the mouth is sometimes a revelation even to a Senior student.

In teaching prophylaxis, it is well to divide the class into sections of twenty each. Take one section into the dental infirmary. Seat one-half of them in dental chairs and have the other ten get out their prophylaxis instruments and go to work on those seated. Go from chair to chair, showing each individually how to hold their instruments. At the next clinic the men who did the work before are seated in the chairs with each section until every member of the class has his mouth put in good condition. Many of their gums will be cut with instruments, tissues lacerated and plenty of calculus left on their teeth. However, it will be worth all the discomfort they endure, for it teaches them the best lesson possible. As you proceed with the course induce the boys to take monthly prophylaxis treatments among themselves.

One of the most convincing arguments for a permanent interest is for the teacher to exhibit some of his private patients who have been on prophylaxis for some time, just to show them what can be accomplished.

In teaching pyorrhhea, the cases which were found in the examination of the students' mouths should be used for clinical material, so that the various treatments can be given under their direct observation. If several cases be under treatment they should be turned over to the students for dressing and applications and the progress closely watched by the professor. No set method of dealing with this lesion should be given, but demonstrate all procedures which seem to have any virtue.

One session the writer noticed that the students of the Senior class were lacking in practical application of his efforts to have them carry off the spirit as well as the letter of his lectures. This following notice was posted on the bulletin:

"TO THE SENIOR CLASS:

"Without further notice, an examination of the mouths of the Senior Class is soon to be made and the mark given at this time will count on the final examination. Any one presenting an unclean or diseased mouth will not receive my name on his diploma."

The report soon came to me from the demonstrator in the Infirmary that he could not get any work out of the boys, because they were so busy cleaning up each other's mouths. When the graduating exerises took place, it was my pleasure to know that the Senior Class presented the cleanest mouths of any class that had ever gone out of the institution, and I believed that many of them would be future missionaries along this line of work. Later results have shown that this supposition was correct, for I have heard of the members of the class giving lectures before the schools in the various towns and leading in school inspection work. Most colleges now have some lectures on this subject, and a few of them have regular chairs, and it is to be hoped that a greater number will see the wisdom of giving this subject the importance which it deserves.

Of interest, showing the trend of the times towards teaching this subject in the dental colleges, is the following statement from Dr. G. V. Black, of the Northwestern Dental University School, who, in a letter to me, April 4, 1913, says, "I have been silent on this subject for a number of years. In fact, I have not written anything since the article for the *American System of Dentistry,* until quite recently, but a couple of years ago I re-arranged the curriculum somewhat, and took this subject myself, on purpose to have

the opportunity of giving my time to it, and of finally writing what I might wish to say."

Dr. N. S. Hoff, of the University of Michigan, in answer to my inquiry of his views on this subject, wrote me March 1, 1913, "The need for this work is tremendous, and I sometimes feel as though it is a particular form of work which will have to be done independent of the dental college work, as I am confident when it is taken into dental college work, it will absorb so much of the time that other forms of instruction will suffer, just as I have found it to do in private practice. It is impractical to do this work in connection with the general practice for the reason that it absorbs so much time. The dentist becomes so much interested in it that he is not willing to allow any patient to go until he has given him a complete treatment, and when this is undertaken, necessarily other lines of work must be set aside."

Dr. C. M. Gearhart, writes me an interesting letter, from which I quote as follows:

"I have been struggling for years teaching 'Oral Hygiene and Prophylaxis' in Georgetown University without a textbook. Oral Hygiene covers such a multitude of sins that I have found it necessary, in a way, to have to review, or rather lapse over subjects taught by other men in Georgetown, in order to make the subject worthy of giving it a course. It has always seemed to me that the teaching of oral hygiene is something more than merely explaining to students that they should keep their own, and advise their patients to keep their mouths clean."

The second edition of the book finds an entirely different status of conditions in regard to teaching these subjects in the dental college. Just two years since the date of the above quotations, nearly all colleges have a regular professor on Oral Hygiene, Prophylaxis, and Pyorrhea Alveolaris. The condensed lectures as sent the author show a great advance in this work. The students are generally en-

thusiastic and have gladly fulfilled all requirements for such a course. If even a small number after graduation carry out their teachings in Oral Hygiene and Prophylaxis, many of the problems of decay and pyorrhea will undoubtedly be solved in the near future.

Dr. Flora N. Haag of the Ohio College of Dental Surgery writes:

"I will send you a list of seven rules which I have outlined for the Junior and Senior students for their cases of Prophylaxis. They know each rule must be followed out for every case of Prophylaxis and it gives a very clean, pretty operation. They are graded in this manner: Ten credits are given if every rule has been observed and the work is well done. One credit for each rule, the number of the rules which is seven, gives them seven credits, leaving three credits for the proficiency of the work. Should the student forget any one rule, for instance, should he forget to attach the small napkin on right hand side of towel, one credit is deducted. This napkin is for the purpose of wiping deposits or hemorrhage after leaving the mouth before returning to sterilizing dish. Should the student forget to instruct the patient as to the care of his teeth, a credit is deducted and so on. I have found this method very satisfactory.

"Rule 1. Have all preparations made before beginning operation.

"Rule 2. Place upon bracket the following:

"(*a*) Glass dish containing antiseptic agent for reception of scalers, files and pyorrhea instruments for use during operation.

"(*b*) A dish containing pomice mixed with Phenolsodique or diluted peroxide, glycerine and a drop of Iodine.

"(*c*) An orange-wood stick.

"(*d*) Port polishing handle and Morgan Moxfield's wood point.

"(*e*) Rubber cup and brush.

"Rule 3. Secure napkin (6 inches square) on right hand side of towel.

"Rule 4. Before proceeding with operation spray mouth or hand patient half glass of water containing three or four crystals of permanganate of potash flavored with two or three drops of wintergreen.

"Rule 5. After polishing, massage gums with some good dental cream on tip of forefinger.

"Rule 6. Before dismissing patient instruct how to brush and care for teeth.

"Rule 7. Use no more time for case of Prophylaxis than absolutely necessary."

It is hoped that this book will, in some degree, meet the requirements along this line, and that it may stimulate other teachers of this subject to record their experiences and methods of teaching.

PART III.

A PRACTICAL DESCRIPTION OF PYORRHEA ALVEOLARIS AND ITS TREATMENT.

CHAPTER XXIII.

PYORRHEA ALVEOLARIS.

SYNONYMS.—NOMENCLATURE.—DEFINITION.—CAUSES. WHAT IS TARTAR AND ITS FORMATION?—KINDS OF DEPOSITS FOUND ON THE TEETH.—BLACK'S THEORY OF TARTAR FORMATION.

Authorities in general medicine and surgery have in a scientific way decided upon a certain framework for the description of any disease. Failure to adhere to this framework by dentists is one of the reasons why we have not come upon any common ground in our writing on pyorrhea. Having received reprints by the hundred, written by the most prominent men in the profession, I find that they vary greatly in describing pyorrhea and do not adhere to the commonly accepted methods of description. The framework used for the description of pyorrhea should be: 1, synonyms; 2, definition; 3, causes; 4, pathological anatomy; 5, symptoms; 6, diagnosis; 7, prognosis; 8, treatment.

If we notice the various reprints on pyorrhea, we will find that in some of them the prognosis is described first, probably the same paper ending with pathological anatomy. It would greatly simplify matters if writers and teachers of this subject would describe it in a systematic manner.

SYNONYMS.

Here we have such a large and unfortunate list that the student is completely bewildered in his selection:

Dr. Rehwinkel first called it pyorrhea alveolaris in 1877, in the city of Chicago, although the name was used in France as far back as 1870.

Black called it phagadenic pericementitis in 1882. Riggs' disease (Bishop), infectious alveolitis, cemento periostitis, calcic inflammation (Black), blennorrhea alveolaris, hematogenic pericementitis, phagedenic pericementitis (Black), chronic alveolitis, interstitial gingivitis (Talbot), periostitis dentales (Schiff), alveolar pyorrhea (Smith), chronic alveolar osteomyelitis (Medalia), oral sepsis (Hunter, of London). Edematous peridentitis, hypertrophic peridentitis, suppurative peridentitis, gangrenous peridentitis (Hoff), alveolar-osteomyelitis.

Dr. H. M. Fletcher, of Cincinnati, urges the adoption of the following classification:

Initial or simple alveolitis, non-suppurative alveolitis, suppurative alveolitis, necrotic alveolitis, acute alveolitis, descriptive subdivisions:

Chronic non-suppurative alveolitis.

Chronic suppurative alveolitis.

Necrotic non-suppurative alveolitis (always chronic).

Necrotic suppurative alveolitis, (nearly always chronic but may be acute).

Zentler, of New York, suggested the name alveolar-dental-arthritis, classifying it as the primary, secondary and tertiary dental arthritis.

Dr. M. L. Rhein classifies pyorrhea by the addition of adjectives stating the name of the disease which he thinks causes the symptoms i. e. "Diabetic Pyorrhea" and "Tubercular Pyorrhea." Prof. W. D. Miller, in his text book on pyorrhea, adopted this classification.

Many dentists prefer the term "Riggs' Disease," because the older practitioners believed that the honor for the beginning of the surgical work should be given to Dr. John M. Riggs, of Hartford, Conn., as he was the first man to advocate a treatment or even to say that it could be cured. The same sort of sentiment prompted this naming as the calling of interstitial nephritis "Bright's Disease." In later-day nomenclature, the fault of this method of adopting

names has been realized and efforts are being made to change many of them.

Vinchow suggests as a substitute for Pyorrhea Alveolaris the term Alveolo-Necrobiosis.

Mitchell, of Pittsburg, endorses this term for the following reasons, "Necro-biosis, death in life, plus the locational indication alveolar, thus Alveolo-Necrobiosis. This term distinguishes this disease from all other oral mal-manifestations. A dental abscess results from the death (total throughout) of the pulp, within the tooth. No other in-the-mouth condition save the necrobiotic process, manifests a gradual, cell by cell necrosis, to the point of complete exfoliation of structure."

The author recognizes that reform is needed in our nomenclature to describe diseased conditions about the teeth. At his request the following essay on "Nomenclature" was prepared for this work by Andrew J. McDonough, L.D.S., Professor of Periodontology, The Royal College of Dental Surgeons of Ontario.

NOMENCLATURE.

Language is a vehicle used for the transference of thoughts. It is necessary therefore that language used in scientific pursuits should be fashioned in such a way that no mistakes in the meaning are likely to occur. This fact has been felt always by scientific investigators and an effort has been made and is constantly being made to make our language as descriptive as possible, to make our words designating an object or action or condition. Consequently our Dental literature which is young, even as is our profession, continually makes use of some new word or combination of words.

This is necessary, undoubtedly, because Dentistry being young and vigorous is rapidly progressing, rapidly understanding conditions hitherto but vaguely comprehended and is finding the necessity of producing descriptive nomenclature

to cope with the ever present newly discovered situations and conditions. Also many conditions, fairly well understood in certain localities by certain groups of men, have been spoken of by each particular group in its own particular mode of expression, consequently, when one man or group of men, who were using the same nomenclature, described certain pathological conditions, they have not been understood by another group of investigators who described the same conditions but used different language, the reason being, that for certain conditions, there has been no universally accepted nomenclature. Better evidence of this assertion could hardly be given than the great number of terms used to describe the pathological condition of the mouth resulting in the destruction of the tissues surrounding the teeth and the eventual loss of the teeth thereby. Without analyzing the merits of all the different terms used for the description of this condition, some of which undoubtedly have a certain amount of merit, though nearly all, if not all, the descriptive terms used are descriptive only of some phase exhibited in this pathological condition. For several years now, in my lectures to the students at The Royal College of Dental Surgeons, I have tried to use terms based on the fundamental fact that there is always a destruction, possibly very minute at times, but existing just the same, a destruction of some of the tissues surrounding the teeth, therefore I have made use of the Greek word Κλαν (Klan)—as a foundation for my nomenclature.

There is no one tissue which immediatetly surrounds all parts of a tooth in the same way as we have the periosteum surrounding a bone. In other words we have no peridental membrane. It is true we have pericemental tissue or dental ligament and gum tissue intimately connecting with the bone of the alveolus, and we have Naismith's membrane, altogether making peridental surroundings or tissue. If we can get a term which is broad enough to include the disease or destruction of any and all of those tissues and then be able

by means of supplementary words or syllables to designate the disease or destruction of any one of the component parts of this peridental tissue, and also to describe different degrees and different kinds of pathological conditions referring thereto, we will have a fairly descriptive nomenclature.

By using the Greek words Οδους (Odous) a tooth, Κλαν (Klan) to break, Πέρι (Peri) around, and make of them a combination, we get the word Periodontoclasia, meaning a breaking down of the tissues surrounding a tooth. This word though fairly long is not as long as Maxillary Pyorrhoea Alveolaris, to which we have become fairly accustomed and for want of a better term have perhaps used it more frequently than any other to indicate all phases of peridental disease.

If we do not desire to use Periodontoclasia, exclusively two much shorter words will convey the same meaning and are perhaps more apt to be more universally used, viz.: Dental Periclasia.

Using the words Πέρι (Peri), Οδους (Odous), and Λόγος (Logos), we can express the study of this pathological condition as Periodontology. We can speak of one who devotes his entire time to the study or treatment of it as a Periodontist, one who practices Periodontia. We can speak of suppurative or non-suppurative periodonto-clasia or dental periclasia.

We can have acute or chronic conditions and instead of using a pyorrhea instrument in our operations, which would mean a pus running instrument we can have a periodontic or periodontal instrument and so on.

The use of these terms does not necessarily mean that many of the terms which we use, must become obsolete. For instance, gingivitis may be a phase in periodontoclasia, nevertheless gingivitis conveys a definite meaning to our minds and is a good term. It is possible to have a condition designated by Maxillary Pyorrhea Alveolaris but it is just one condition describing a phase of Periorontoclasia and can

be expressed under the title suppurative periodontoclasia. There is a condition of periodontoclasia which is seldom described. Sometimes the bone of the alveolus wholly or partially disappears, so that the teeth and the surrounding tissues move easily on pressure, yet there is no pus discharge at the gingival margin and no break in the peridental tissues. This phase of periodontoclasia can be designated by the term Alveolar Osteoclasm. Of course, the term, alveolar osteoclasia can be applied to a breaking down of the maxillary alveolar tissue whether accompanied by infection or not, so long as we use the proper qualifying term, suppurative or non-suppurative.

When infection has taken place and the condition is chronic we will have an osteomyelitis which will sometimes result in necrosis of the maxillary bone and carry us beyond the realm of periodontoclasia, but in this article we are not dealing with the nomenclature of pathological conditions which are not immediately contiguous to the teeth.

There is just one other term which will be taken up in this article namely, "Tartar." This word is so often used and so seldom challenged that one is apt to forget that it is not correct and to forget that it had its birth through a misunderstanding of the conditions which it was supposed to designate. It is generally conceded at the present time that so-called "tartar" is a deposit principally made up of lime salts which are thrown down from the saliva, the saliva meaning the secretions of all the glands leading into the mouth and usually spoken of as mixed saliva. The aforesaid deposit therefore is more correctly spoken of as Salivary Calculus.

If we do not remember this fact we are apt to speak of removing tartar from the end of a root which has had a chronic alveolar abscess on it and also of removing tartar when we mean serumal calculus from other positions on a tooth root.

There are some terms such as Oral Hygiene and Oral Prophylaxis about which the profession are at present un-

decided and about which opinions are expressed in another part of this book and which will some day have a perfect definition accorded to them, but at present the foregoing are the only words on which the writer desires to express an opinion.

In writing on the "Bacteriology of Pyorrhea Alveolaris" Dr. C. P. Brown says of the name:

"While this name may not be scientifically descriptive, its use during approximately half a century has given it associations which can not be misunderstood."—*N. Y. Med. Journal.*

The author is not convinced that any one of the above should be accepted. However common usage at the present time almost compels us to use the term pyorrhea alveolaris until a better term is suggested and adopted.

DEFINITION.

Dr. Chas. B. Atkinson, defined this condition as "a disease following congestion of the myxomatous tissue of the oral cavity, affecting with wide range of loss, the gingivæ, alveoli, and teeth, from slight recession of the gums to entire solution of alveolus, and the consequent loss of tooth or teeth involved; therefore, perhaps more properly 'pyogenic gingivitis."

Dr. C. N. Peirce described it as follows: "A chronic inflammation of the pericemental membrane, attended by a congested, spongy and tumefied condition of the gums and mucous membrane, and usually accompanied by a persistent flow of pus from the alveolar sockets. In the progress of the disease the alveolar process, under the influence of engorgement of the periosteal vessels, becomes involved and eventually undergoes atrophy or absorption, leading to an exfoliation of practically normal teeth," and ascribes its etiology to the uric acid diathesis of the patient.

Dr. G. V. Black describes it as "a specific infectious inflammation having its beginning in the gingivæ, and accom-

panied with the destruction of the peridental membranes and alveolar walls," and while not committing himself, says that probably it is caused by the presence of some peculiar form of micro-organism and that it is infectious.

Dr. Rhein defines it as follows: "While pyorrhea alveolaris literally means a discharge of pus from the alveolus, the simplest definition of its pathogenic condition commonly accepted under the term would be that it represents a diseased condition of the peridental region due to impaired nutrition."

Dr. D. D. Smith says, "mouth pyorrhea is a disease of uncleanliness."

Dr. W. J. Younger preferred the name pyorrhea alveolaris and gave this definition: "Pyorrhea alveolaris is characterized by an inflammation of the gums and a deposit of characteristic greenish gray or slate colored tartar and the wasting of the alveoli accompanied by the formation of pus and pus pockets between the tooth and alveolus; the disease being due, as I believe, to a specific bacillus. The disease is chronic in its duration and results in the ultimate loss of the teeth. This slate colored incrustation of which I have spoken, I consider pathognomonic of the disease."

Pickerill in his book on "Oral Sepsis" gives the following definition:

"Pyorrhea alveolaris is essentially a suppurative process occuring in the joint around the tooth between it and the jaw bone; it may be localized or general, but usually is found associated with groups of several contiguous teeth."

Dr. A. F. James in his president's address of the first meeting of the American Academy of Oral Prophylaxis and Periodontology (Washington, D. C., November, 1914) gave the following interesting description:

"I call pyorrhea alveolaris a 'disease,' but I am not able to convince myself that the word is a correct one in the sense that Rigg's disease has, or ever will be found to have a specific organism as its source. To-day, we are justified

more properly in speaking of it as a condition—a condition of active fermentation which has advanced to the stage of infection and is attacking the tissues through an entrance gained at some point of irritation or abrasion of the general margin. But because we do not know the specific organism of pyorrhea (if there is a specific origin) we need not distrust any of the facts which have been accumulated during the long years of our practice. We need not distrust them any more than a physician in the tropics need distrust his diagnosis when a patient has been exposed to the attacks of stegomyia and exhibits acute symptoms of yellow fever; although, the inimical organism of yellow fever has not been isolated."

CAUSES.

The etiology of pyorrhea is given as local and constitutional. A few years ago the latter was advocated by many of the leading men of the profession and many valuable papers were published and read upon "Uric Acid Diathesis," "Rheumatism," etc., as the etiologic factor, but today those who are making the greatest success of their treatment are almost unanimous in their opinion that local causes should be decided upon as the greatest factor.

It is not denied that the general systemic condition of the patient has an influence and must be looked into and treated, but this should be considered as only a predisposing factor or complication of the pyorrhea. Personally, we believe that if a mouth is maintained in a good condition, with the absence of local causes hereafter mentioned, no systemic disorder would ever produce a case of alveolar pyorrhea. In other words, there are no systemic reasons for the cause of pyorrhea other than those which may predispose to any disease.

Younger claims that temperament has no bearing on this disease, while Smith opposes this view with the declaration that pyorrhea never develops in the purely sanguine but always in the bilious, the lymphatic, and the nervous temper-

ament. Impaired nutrition, heredity, constitutional disorders, excessive lime salt secretion, uric acid salts, scurvy, luxury, sedentary habits, toxic agents introduced into the system, chronic infections, and the eruptive fevers have also been named as causative agents of pyorrhea alveolaris.

In answer to those who hold the above causes Hutchinson says:

"I have no doubt that in cases where diabetes, syphilis or other serious systemic disorders are coincident with pyorrhea, the pyorrhea antedates the constitutional disorder and has been accentuated but not caused by such disorder. If such mouths had always been under prophylactic treatment

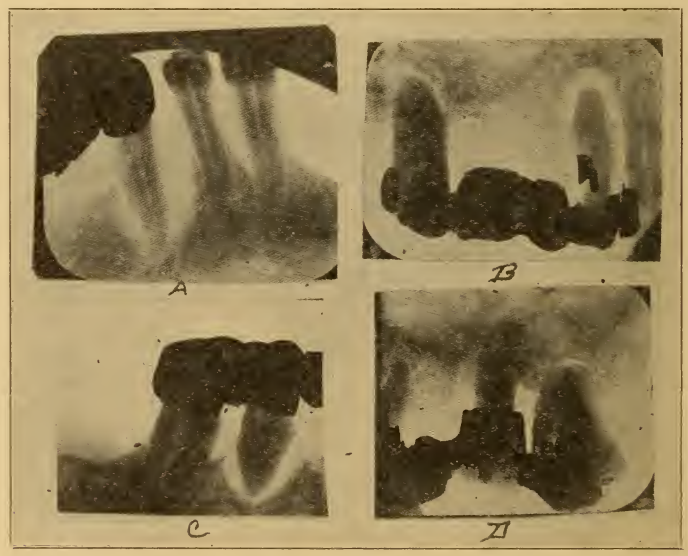


FIG. 78. These pictures illustrate the serious responsibility we assume to allow the ordinary bridgework to remain in the mouth. The X-Ray is our surest guide in these cases. (A) Too long a span, and too much stress on the abutments. Replaced with a removable bridge with bracing bar to opposite side of mouth. (B) This bridge should never have been put on. The teeth were loose when inserted. The teeth had to be extracted. (C) This patient had several teeth under bridges with no attachment to jaws. When bridges were removed, these teeth came with it. This patient suffered with rheumatism, which got better when these bridges were removed. (D) A bridge and teeth still firm but about to be shed. (Author's cases.)

I believe there would be no pyorrhea. The amount of tissue lost, both hard and soft, indicates that the process of destruction has covered a period of many years and could not have taken place within a comparatively short time. Usually pyorrhea in some stage exists long before it becomes manifested to either the patient or the dentist, and so the error of believing it to be of recent occurrence is often made."

The initial cause of pyorrhea is sometimes so small and simple as to be overlooked. As before stated, the object of this discussion is to be of a practical value and only the causes that we positively know and see every day are given:

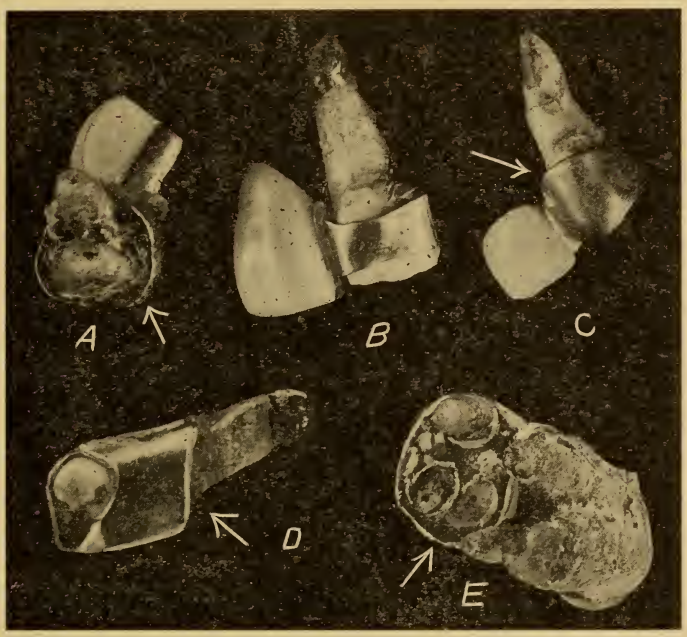


FIG. 79. The kind of crowns and bridgework which either cause pyorrhea or loss of teeth when placed on teeth. (A) Molar wing bridge; notice the fit of abutment. (B) Wing bridge worn by patient for fifteen years. (C) Wing bridge which by excessive strain and bad fit of crown caused pyorrhea and loss of tooth. (D) The worst fit in collection. (E) An ill-fitting gold crown put on with extension to splint adjoining loose pyorrhea tooth. Enlarged. (Author's collection.)

1st, Deep interlocking cusps on bridge work, causing too great an irritation on the abutments and setting up inflammation in the membrane supporting them, finally giving rise to pyorrheal conditions. (Fig. 78.)

2d, Wing bridges. (Fig. 79.)

3d, Bad bridge work with special reference to sanitation. (Figs. 78-79.)

4th, Partial dentures which may have any kind of swing on one tooth.

5th, Ligatures, clamps and wedges in ordinary dental operations where the contusion of the gum margin is not treated after their removal.

6th, Mal-occlusions of natural cusps, fillings, or crowns. Whether mal-occlusion is a cause or result of pyorrhea, there can be no doubt about its importance, no matter what the treatment may be. One of the greatest aids is in grinding down markedly prominent cusps and in putting out of action those teeth which are weakened by this disease. The best method of determining this is to place the index finger longitudinally across the teeth and then let the patient close the mouth, and shake the teeth. If this discloses the fact that the affected tooth is being moved to a greater extent than the others, it is an indication that too much stress is being placed thereon.

Dr. R. G. Hutchinson, Jr., of New York, says: "Of late I have been more impressed with the importance of mal-occlusion, either general or localized, as a prime factor in the establishment of pyorrhea, and my first attention is given to this correction by grinding."

Dr. Hartzell does not take kindly to mal-occlusion as a cause of Pyorrhea. He believes that the bone destruction there is just as any other type of mechanical imperfection, in that the conjestion of the tissues, due to over application of force, leads to adema and the weakening of tissue resistance which enables bacteria to gain access more easily. As proof of this, he calls our attention to the fact that when an

infection occurs, it begins in the interproximal tissues, or in the protected areas where bacteria can grow undisturbed.

7th, In the disturbance of the contact point of the teeth, whether it be from a small separation, or from malshaped points, allowing food fibres to pack in and gain a point of vantage for future destruction. A large number of pyorrhea pockets are undoubtedly formed in this way, the so-called "meat holes."

8th, One of the most unbearable forms of pain in the mouth is caused by the abuse of wood tooth picks and floss silk. Splinters of the picks break off in the mouth and, when the patient comes for treatment, we sometimes are not able to find the cause of the inflammation. This, in time, causes loosening of the point of contact, allowing further inroads into these inflamed surfaces.

9th, Any mechanical irritation lodged under the free margin of the gums surrounding the tooth will set up initial lesions. Shedding bristles from tooth brushes, small seeds, grit (possibly left from cleaning the teeth), skin flakes from vegetables or fruit—any one may cause this. The gum, being unable to free itself from this irritation, inflammation follows, affecting the peridental attachment and the alveolus.

10th, Pickerill has called attention to the ragged enamel at the junction of the crown and root of teeth. Hartzell believes this rough surface a culture bed for bacteria, and one cause for Pyorrhea. Before beginning his operation, he smooths this surface with suitable files, stones, and pumice. By giving attention to this surface first, the danger of getting pumice into the pocket is not as great as if he scaled the root and then used the polishing measures on the enamel.

11th, Tartar formation: While it is true some cases of pyorrhea do exist where seemingly there is no deposit of tartar present, they are in such minority as to be a rare exception. Such cases may at one time have had this forma-

tion; furthermore, such minute particles can start trouble that we can not say with certainty but that all cases have some form of tartar which must be removed in our treatment. The greatest factor in the successful treatment of this condition is the finding and complete removal of tartar.

Many writers do not use the word "tartar," but prefer the word "calculus" as more accurate and scientific. Salivary calculus describes in general that deposit which forms on the teeth due to some disturbance (whether physical or constitutional) of the saliva. The word tartar is understood by every dentist and is often used interchangeably in the book with salivary calculus.

12th, Uncleanliness: Probably the most important and most frequent cause of pyorrhea is that at some period of the patient's life there was a lack of intelligent care of the mouth. A volume might be written on the causes of pyorrhea, but we have to admit that the greatest factor we have to deal with is uncleanliness of the mouth. The first section of this book deals in full with this.

13, (a) Bacterial invasion and (b) parasites.

Our scientifically inclined operators and research workers are at present giving much thought to these last named causes. Great advance is being made each month. We have a fairly well-established consensus of opinion in reference to the bacterial flora of the mouth, but not so in the case of the parasites.

Only a small amount of data is given on these two causes, for the reason that this work is written for the purpose of dealing with the practical treatment of the general practitioner at his chair. The reason lies in the fact that the above twelve causes have to receive adjustment and treatment, no matter what other contributory cause may be associated. Another reason is that, if the treatment is practical and thorough, good results are sure to follow, even though the dentist does not know the difference between bacteria and parasites. The author does not wish to be mis-

understood, for he believes that all dentists should acquaint themselves with the general facts conceiving the bacterial flora of the mouth, and of the parasites as well. This is imperative if the operator contemplates making the treatment of Pyorrhea a specialty, however, he would not deter the dentist from handling Pyorrhea cases because this knowledge has not been acquired.

(a) The Bacteriology of Pyorrhea.

The bacteria of the mouth in a Pyorrheal condition are so numerous as to kinds and variety that the bacteriologists have been unable to agree or to harmonize these difficult and complex findings. Almost all discovered bacteria may be found in some of these mouths if we examine the mouth flora of a large number of cases. The more chronic the Pyorrheal condition the greater number, for the simple reason that they find more favorable conditions to multiply.

The findings and different views about the bacteria of the mouth requires a book in itself and only a few of the latest and most authoritative suggestions are mentioned.

The mouth normally contains the streptococcus. This usually is harmless but the most serious consequences sometimes result from their action. This harmless germ may cause septicemia, endocarditis, or the most virulent type of Pyorrhea. The modus operandi of this change in character was not well understood until the findings of Dr. E. C. Rosenow, who showed that these useful and harmless streptococcui under certain conditions are transmuted into other forms of the pathogenic type.

Some investigators do not agree with Dr. Rosenow in the variety, but think the number is responsible for the severity of Pyorrheal conditions. Certain it is, the less cared-for mouths will furnish a better cultivated and more fertile field of bacteria.

This latter view is held by Prof. Rosenberger of Jefferson Medical College, Philadelphia. Dr. F. E. Stewart thinks the initial lesion of Pyorrhea so lowers the resistance

of the mouth tissues that bacteria can infect and having become accustomed to live on living tissue become parasites and cause the more serious cases of infection. Prof. Rosenberger is also opposed to this view believing that the ingress of the bacteria into the blood stream from diseased gums does not generally occur, but rather the blood absorbs the toxic products of the bacteria. Constant swallowing of the products of putrefaction is the cause of whatever gastric disturbances we may have from Pyorrhea.

The micro-organisms in Pyorrhea are well protected, due to the dense membrane which they inhabit, to the large amount of granulating tissue present, calculi, and the further fact that the parts here are so poorly supplied with blood vessels. The blood contains special ferments which are destructive to bacteria, but, because of the above mentioned protection, they can't be placed into the pocket or fort held by the Bacteria. If this were not the case, we would probably not have any Pyorrhea infection, for it is rare where a case of primary blood infection occurs. For this reason, we must see that the only logical treatment of this disease must be to either extract the tooth, or to surgically remove this culture bed of infection.

Nearly all mouths contain the Pneumoccus, whether this is the true Pneumoccus is a debatable question. We do know that some of the worst infections and complications from Pyorrhea are due to its presence. Post operative Pneumonia is due in many cases to Pyorrhea mouths having a super-quantity of these micro-organisms.

The *Treponema mucosum* is a new species of Spirochaeta reported by Dr. Noguochi. This organism presents an appearance much like that of syphilis. Its action is Pyorogenic and it will not grow in healthy tissue. The peculiar odor of Pyorrhea is produced by this organism.

Dr. E. C. Rosenow has opened up a new field for those who are interested in the bacteriology of the mouth. His

discovery was the transmutation by animal passage of the streptococcus vindans into pneumoccus. He explains that the organism in rheumatism locate in joints and endocardium because of the low degree of oxygen pressure in that these structures are very avascular in that here we meet the end of the capillary supply. The same infection by the process of convertion may show streptococcus vindans in endocarditis and hemolytic streptoccus in the joints. However, the point in his investigation of most importance to the dentist is his statement as to the extent of infection and the place where these infections occur. "It is safe to say that the focus is most commonly found in the oral cavity and here in order in frequency is probably the tonsil, pyorrhea and blind abscesses about the teeth."—(Journal Lancet).

(b) Parasites in the mouth and their relation to Pyorrhea.

At the June, 1914, meeting of the Pennsylvania State Dental Society, Dr. M. T. Barrett read a preliminary report as to finding the parasite entamoeba, buccalis in the mouths of forty-six individuals having Pyorrhea Alveolaris. This report and the one following it, read at the National Dental Society Meeting, at Buffalo, were very guarded as to a positive declaration that this organism was the real cause of Pyorrhea.

Dr. C. C. Bass, about the same time, reported the finding of amebae in one hundred patients examined. He was very positive that this organism was the causative factor. At the present time, Dr. Bass is certain that only Pyorrhea mouths possess amebæ, but offsets this with the further statement that about 90 per cent. of our population have Pyorrhea. Among the methods given of acquiring this organism are: kissing, the common drinking cups, putting articles into the mouth which other people have had in their mouths, and contaminated water and food.

Dr. Bass says that these organisms are in greater numbers in the bottoms of the pockets and that, in this way, the bacteria are drawn into the depths of the pockets.

Since scientific investigations have been in vogue with the dental profession, since we have known anything about bacteriology, every once in a while some investigator claims that certain germs or parasites are responsible for diseased conditions of the mouth. However, none of these have had the success of the recent investigators, Barrett, Smith, Bass and Johns. Like a bolt from a clear sky, before the dental profession could make investigations properly, the laity papers throughout the land, and the Medical Journals proclaimed that at last the absolute cause of Pyorrhea had been found and its sure cure was at hand. Inside of three months, the pharmaceutical houses all over our land got out nicely printed literature containing the reports of these gentlemen on the Endameba Buccalis, claiming that they had the particular form of ipecac which was to be our salvation in its cure. As soon as some of us could catch up with this rapid development, and had begun to catch our breath for investigation, we found that every dentist in the land was spending a larger amount of money for Emetine than they had ever spent to cure Pyorrhea before.

I would not for a moment decry any new movement or discovery, and no one is working harder on experiments and practical cases to keep up with every new development than myself, but I do deem it unfortunate indeed that this new development was thrust upon the profession just at the time when we had begun to work and master the surgical technique necessary to save these teeth, and now comes, these gentlemen, deriding such means as having failed. Surely it is to be hoped that this attempt to throw aside our successful technique will be short lived.

Of course, in a report of this kind, this matter must be brought down to its latest form. First, we must remember

that the bacteria of the mouth are flora, of vegetable origin, like wheat or corn. These are microscopical in form. Many years ago, investigators found in the secretions of very dirty mouths, unicellular bodies, larger bodies, which were not of the flora form, but parasitic, these were given the name of Endameba Buccalis. The gentlemen above referred to about the same time in Philadelphia and New Orleans, found more of these in Pyorrhea mouths than in normal mouths, this lead them to the conclusion that this was the cause of Pyorrhea. These Amebæ can be seen moving about in the microscopic field, also a large amount of bacteria, then it is a question what the amoeba are there for, whether they intend to destroy the alveolus or gum structure, or have only crawled into these pockets for a meal of bacteria, for this reason it is a question whether or not the amoeba is pathogenic to human tissue. It is my opinion that the parasites are normal residents in even the mouths of children, and the greater the bacterial coat, the greater the filth in the mouth, the easier they can propagate. In their enthusiasm due to their findings, the investigators fail to produce sufficient proof of the amoeba as a causative factor. For instance, I might say that blue eyes cause Pyorrhea. I might be of sufficient importance to have it heralded all over the country, saying that fifty per cent. of the people affected with Pyorrhea have blue eyes, therefore, blue eyes are the cause, and, further, prove the statement by saying that many people who do not have blue eyes do not have Pyorrhea. So it is with the Endameba Buccalis, they are found in Pyorrhea mouths, therefore they cause this disease. I might be passing through the fields and find a carcass, the flesh of which was full of animal parasites. I would go on a little further and find another carcass and in the flesh of this one also might be present more of the same parasites, also I could remember that years ago I had seen the same thing, then I might immediately draw the conclusion that these parasites

were the cause of the death of the animals, never going back to investigate if some other agent had caused the break in the continuity of the life of the animals. If we could keep the Pyorrhea mouth free from germs, we would probably not find the amoeba present in as large quantities.

It seems to be necessary to recall to the minds of our medical friends that the dental profession has for years been curing Pyorrhea and that this has been accomplished by performing the proper surgical work and after proper similation of the structures and only after these procedures, have we cured Pyorrhea and then, without regard to Amebae. The method used was to remove this coat of bacteria and then the tissues given proper stimulation, the patient has been cured of Pyorrhea.

Can anyone look at the dead peridental membrane on an extracted Pyorrhea tooth, can anyone look at the skull of a dead person who had Pyorrhea and see the bone destruction there, can anyone after seeing these sights, say that he believes the application of any drug could remove the cause of Pyorrhea and cure it? Thus we do not underestimate the importance of Amebae in Pyorrhea cases, but we must discredit the reports of the marvelous cures from the use of Ipecac only.

Does it have any bearing on the facts in the case to say that a man having Amebic Colitis was given one hundred sixty grains of Ipecac without any sign of improvement of the diseased mouth? Does it have any bearing on the case to say that within one month after this, when his mouth had been cleaned up, the disease was eradicated?

Does it have any bearing on the case to state that when I have a splinter in my finger it suppurates, then I might by the injection of Emetine arrest the suppuration for a few hours, if I should still leave the splinter in the finger, a relapse would occur? This is the same relapse that is so often spoken of by the investigators who treat Pyorrhea by

Emetine. The cause is still there in both cases and must be removed before a permanent cure can be effected.

I have used Emetine, am using it, and shall continue to use it, but it is on thorough surgical work that I depend for my cures. In reading the various advertisements of the pharmaceutical houses not only of Emetine, but for other drugs also, I have been struck with the emphasis which has been put on the statement that they are absolute cures with slight reference to surgical help. It reminds me of once when I looked through an automobile magazine at the various advertisements in regard to appliances for saving gasoline, every one claimed from forty to fifty per cent saving. I figured up that by using every one advertised I would run my car without water, oil or gasoline. However, I still find it necessary to have plenty of all of these before starting out on a pleasure ride. Thus it is just as necessary for us to go back to thorough instrumentation as it is to have oil, gasoline and water to run an automobile, that is until some other agent now unknown, is discovered for the treatment.

Read the recent papers by Dr. Bass and compare his claims and findings with a paper read before the New York Pathological Society, 1907, by Dr. L. T. LeWald, in which he showed amebae could be demonstrated in the mouth almost constantly, no matter how much care was taken of the teeth. The Bureau of Laboratories of the New York Health Department will next month publish their report on "Amoebas in the Mouths of School Children." If Dr. Bass' claims are true, then all school children have Pyorrhea.

Does it have any effect on the status of Ipecac Treatment when we read that Drs. Merritt, Hartzell, Talbot, West, McCall and other distinguished investigators in the field of Pyorrhea could not verify the results claimed for this treatment? A distinguished medical investigator, Rosenberger, of Jefferson Medical College, chair of bacteriology,

writes me as follows: "The ameba buccalis plays very little, if any part in the etiology of Pyorrhea. * * * My own results with Emetine have been very poor." Dr. E. C. Rosenow, of Chicago, writes me under recent date that "the work of Bass and Barrett in the use of Emetine in the treatment of Pyorrhea is very interesting, but I fear that they have not sufficiently emphasized the need of proper dentistry in the way of removal of tartar, deposits, etc., for the permanent relief."

The greatest mistake made by Dr. Bass is that he declares every individual has Pyorrhea, just because he believes the Ameba is the cause of Pyorrhea, and he finds that in all mouths. Dirty, filthy mouths have the largest number of these parasites, and it is a strange fact that just such a mouth may be free from Pyorrhea. On the other hand, Pyorrhea may be present in a well kept mouth. As Pyorrhea Alveolaris is an affection of the peridental membrane of the tooth with the formation of tartar and the molecular death of the alveolar process as its last stage. The most severe cases may not have any pus present.

Many physicians have of late been giving their patients Emetine by the hypodermic method without a proper diagnosis of Pyorrhea. Some of their patients have come into my office with both arms so sore they could not do their ordinary duties. Some of these had no Pyorrhea. I have seen ulceration of the mucus membrane of the mouth due to the physician prescribing Ipecac as a mouth wash. The writer urges physicians to examine and diagnose Pyorrhea, but believes the co-operation of a dentist in the treatment will result in more good for the patient.

[Under the sub-head "Treatment by Emetine" will be found further information on the subject of the Endameba Buccalis.]

WHAT IS TARTAR AND HOW DOES IT FORM?

Tartar is a concreting material, either secreted or concreted in the mouth from the saliva, which is deposited on the teeth or artificial dentures. Various hypotheses have been advanced in explanation of these deposits. We do know that the bulk is composed of calcium phosphate and carbonate, and that certain places are more liable than others to the accumulations. One theory is that the saliva holds these salts in a very unstable suspension, and, in the presence of air, carbonic acid gas is liberated and the calcium salt precipitated.

Burchard claimed that the saliva, as manufactured by the glands, is of alkaline reaction, holding in solution the salts of calcium. His theory was that in most mouths the reaction is acid and the coming together of these two opposite chemical compositions results in a precipitation which is insoluble in the acid medium.

A third theory is one of crystallization. Younger holds the view that some bacteria form a nucleus or nidus about which layer after layer of these salts are precipitated; especially does he believe this to be the cause of the formation of serumal calculus, the idea being that it was just the same as the crystallization of syrup starting around a thread. These theories seem to have resulted from the observation that calculus formation in other parts of the body generally contains a lump of bacteria around which they have been formed.

The fourth hypothesis is that the calcium salts are held in suspension, and when the saliva stagnates, the heavier substances collect in favored situations.

KINDS OF DEPOSITS FOUND ON THE TEETH.

There are probably many variations in the character of the deposits on teeth, but the most important from a pyorrhea standpoint are as follows:

(a), Sordes is the soft, creamy, pearl gray deposit on the teeth and differs from tartar in that it does not concrete, though it is sometimes mixed with a form of tartar and partially concreted.

(b), Granular mass, less hard than calcium sulphate. This is generally found in large quantities on the lingual sides of inferior incisors and on the buccal surfaces of the upper molars. (Fig. 80.)

FIG. 80. DEPOSITS OF SALIVARY CALCULUS. (Author's Collection.)

(c), Concretions found below the gum margin; color, light yellow to dark green. The light concretion is soft while the dark one is hard. Some have thought that the greenish scales around the margin of the gums might be caused by the disturbance of the gingival glands. Pattersons says, "These deposits are from purulent matter and are the sequence of irritation and inflammation from the various local causes referred to. They are not precedent to a

lesion but invariably are subsequent to irritation and exudation."

(d), Serumal calculus. (Fig. 81.)

The red or greenish color of the second variety named is given by the escape of heamatin of red blood corpuscles due to the rupture of small blood vessels by mechanical irritation of the deposit. The extreme hardness and brittleness which we often find is probably due to the absorption of uric acid from the blood. It is supposed that this occurs only with those patients whose system contains a large amount of uric acid. From this observation many dentists at one time believed that the whole cause of pyorrhea could be explained by the theory of the uric acid diathesis; but this theory of its etiology has been discarded by the majority of the dental and medical profession.

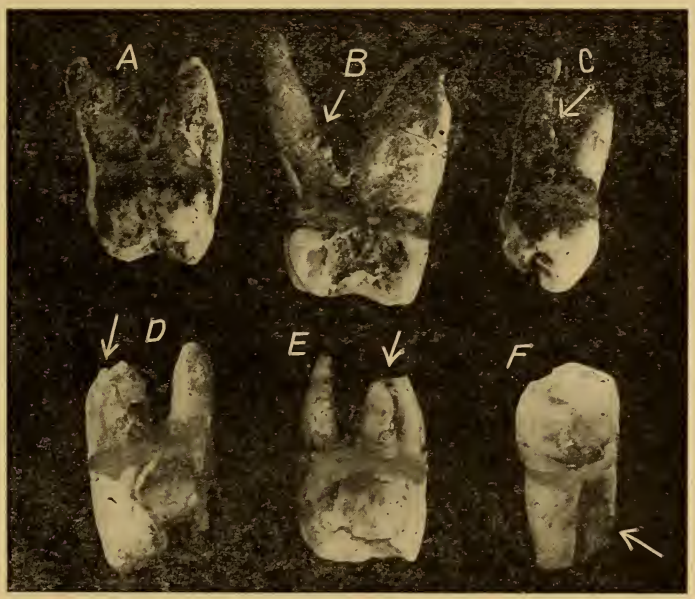


FIG. 81. SERUMAL CALCULUS ON DIFFERENT PLACES ON THE ROOTS OF TEETH. ABSORPTION OR EROSION ON C, D AND E. (Author's Collection.)

Dr. P. R. Howe reports from his experimentation that the only difference between salivary and seruminal tartar is that of the "matrix of deposit." In neither has he found the presence of urates.

The fourth variety of calculus (d) was first called "serumal" by Brown, of Georgia. This secreting and concreting material is supposed to be formed from some break in the peridental membrane and effusion of the serum of the blood. If this theory is correct the process has never been successfully explained.

At the point of location of the other varieties of tartar we have direct contact with the saliva, but with the serumal calculus it is claimed that the formation may take place in the peridental membrane without any show of external communication with the saliva of the mouth. The very existence of such a formation has been denied by many, who claim that when calculus is found on a tooth there is always some external opening which can be found by careful probing with a small instrument under the cervical edge of the gum. Nash advanced some strong arguments on the impossibility of the formation of serumal calculus or tophus in the peridental membrane.

BLACK'S THEORY OF TARTAR FORMATION.

Dr. G. V. Black has recently reported some interesting experiments about the formation of tartar. His theory is that the susceptible mouth contains a material which he terms the "aglutinating substance." This substance is transparent and slightly sticky. This serves to gather and hold particles of calcium salts which are precipitated from the saliva. This gradually hardens after a few days. In his personal experiment with a slot cut in his artificial set of teeth he advances the idea that salivary calculus may be controlled to a certain extent by the diet. Eating too much caused him to have a greater deposit, while the use of a

saline cathartic would cause a cessation of deposits for a week or more.

Before the advent of prophylaxis, dentists were paying most of their respects to the hard deposits as the principal factor in dental lesions but recently we believe this to be a mistaken idea, and that the soft deposits are more vicious in their action on the soft tissues. In fact, upon the removal of large quantities of tartar from the teeth, we frequently find the tooth in a well preserved state, and the gums comparatively healthy, but we never find this to be the case when the sordes or soft deposits are removed, because the latter contain a great amount of infection; we sometimes find the tooth in a leathery condition and the soft tissues always in a state of inflammation.

CHAPTER XXIV.

PATHOLOGY OF PYORRHEA ALVEOLARIS.

RECESSION AND CONGESTION OF THE GUMS.—THE PERIDENTIAL MEMBRANE.—THE ALVEOLAR PROCESS.—TOOTH ROOT ABSORPTION.—FORMATION OF PUS POCKETS.—ALVEOLAR ABSCESS IN PYORRHEA.

RECESSION AND CONGESTION OF THE GUMS.

The pathology of dentistry should be considered in the same manner as the pathology of surgical diseases. In dentistry the attempt to bring up a different pathology has been due to a lack of proper knowledge and observation.

In taking up the work of pyorrhea, the dentist must have an accurate knowledge of normal conditions in order to be able to detect a deviation therefrom. Also, a complete knowledge of the histology of the gums, teeth, and maxilla is imperative. First should be noted the appearance and color of the normal gum. We will note that there is no tumefaction of the gum margin; also that the gum margin clings to the teeth at the enamel margin, completely surrounding the tooth at the insertion into the bone.

The teeth most often affected by pyorrhea seem to be the lower incisors. Next in the order of frequency, the superior molars and bicuspids; then the inferior molars and bicuspids; the superior incisors; lastly, the upper cuspids.

Recession of the gums is not necessarily a feature of the pathology of pyorrhea, although some medical men and many of the laity have at times mistaken the recession of the gums, especially on the upper cuspids, for pyorrhea. This recession is the result of not receiving circulation enough to keep up peridental life and a constant diminution of the

thickness of the alveolus and the hardness of the cementum. This structure either moulds into the dentine or recedes towards the root when conditions are abnormal.

Fig. 82. Recession of gum due to pyorrhea. This is generally greatest on lower incisors. This mouth had a large amount of pus present on lower jaw, while upper was in fair condition. Patient had been in bed about a month with little attention given her teeth. This is a curable case.

The recession of the gums at the cervical margin brings most patients to the dentist for the treatment of pyorrhea. At this stage we find the peridental membrane either exposed or destroyed in part, forming a hot bed for the culture of bacteria which continue their action in destroying the alveolus and inflaming the periosteum. This recession is caused by the falling in, as it were, of the supporting structures. (Fig. 82.)

A specialist on the treatment of pyorrhea was once criticised by a fellow dentist in this fashion, "Dr. ——— doesn't treat pyorrhea; he treats gingivitis, and makes people think

he is curing pyorrhea." This statement showed the evident ignorance of the speaker upon prognosis in pyorrhea.

The best, and only proper time to begin treatment is during the existence of what he called "Gingivitis." When we can get a case in hand when the gum is red and the tissues slightly swollen, we are absolutely sure that we can cure the case. Woe to the dentist who sees this condition and lets the patient run along from bad to worse! He may soon have a case that is not only beyond his control, but is beyond the control of the specialist also. So we must say that the operator who is curing Gingivitis is doing the best Pyorrhea work.

Although the patient worries about the gums, it is oftentimes the least affected structure and, if the infection be removed, soon resumes its normal appearance and function as a protection to the structures which underlie it. Just as often do we find the opposite picture. Instead of recession we find a swelling and congestion. On squeezing the gums, pus will generally exude. On the other hand, I have seen cases where there seems to be no pus; but there is infection, and pus either has been or will be the next step in the progress of the disease.

Probably one of the most constant diagnostic points in pyorrhea is the tumefaction of the gum tissues. The extent of this tumefaction may be from a few lines in width at the gum margin to a heavy roll of tissue extending the full breadth of the roots of the teeth. This tumefactory condition may be hard and firm, and when this is the case, the color of the tissue will be a light lilac or, if the pocket beneath be extensive, of purplish tint. However, this tissue may present a very different clinical picture in that the tissue may be very soft and fluffy, bleeding upon slight irritation, as in brushing the teeth. In the latter condition we find

more pus and we also find that the teeth are looser than in the former condition described. (Figs. 83-84-90-113-115.)

FIG. 83. A typical picture of pyorrhea alveorlaris. Note the rounded glossy gum tissue. The accumulation of tartar just under the gum. The beginning recession. The pus pockets. The flow of pus which has flowed out on lower gum and lip due to pressure of holding lip for picture. This is a curable case.

Often the gum is filled with inflammatory exudation, giving a rich crimson (chronic state bluish) color, due to the accumulation of cells in the connective tissue. (Fig. 82.)

This gum bleeds at the slightest touch. Inflammation may extend only to periosteum or into the alveolus. If the condition of swelling continues and the gum continues flabby about the tooth, like hypertrophied tissue, the best treatment is the surgical trimming with knife or scissors.

When the patients are about to be dismissed after treatment, they often call attention to the fact that their gums have receded more than they did previous to treatment. This seems to them a most serious question, and the dentist should be very careful to convince the patients that such re-

FIG. 84. Tumefaction of gum tissue. In young patients this condition is more prominent than the so-called pockets.

cession always follows a correct treatment, because of a reduction of the inflammation and a return of the gum to its natural thickness. In addition to this, the alveolus surrounding the teeth is now much less than before disease, or, having been removed in the surgical work, gives the gum covering it the opportunity to fall further away from the crown of the tooth.

This recession, if extensive, may, in the future, cause trouble for the reason that the flap of gum tissue which normally protected the interproximal space from food impactions may be too low to protect this space against further inflammation and infection from packing. It must be well understood that in these cases the patient should present at

frequent intervals and have such spaces cleaned by their dentist.

THE PERIDENTAL MEMBRANE.

The object of the peridental membrane is to transmit nourishment to the teeth and to furnish elasticity and a cushion under force, or a sling in which the teeth are held.

Dentists have been taught that the peridental membrane partook more of the character of a periosteum, but later investigators claim this structure to be a true alveolar-dental ligament. Microscopical examination reveals solid bundles of fibres of Sharpey which extend from the tooth out into the alveolar process. The insertion is about the same as ligamentous insertion into bone in other parts of the body. These fibres of Sharpey, according to several authorities, form circular rings which suspend the tooth in its socket.

The peridental membrane has for one of its purposes the nutrition of the cementum. This membrane may be separated from the tooth or completely absorbed at the time of the first injury, be it tartar, bad dentistry or infection.

Healthy strong teeth are often exfoliated from the alveolus because of hypernutrition, which results in deposits in the substance of this membrane making it resemble the cementum, or the membrane may be so feeble in its function as to shut off nutrition with like result. Cases of loose teeth from this cause have frequently been diagnosed pyorrhea.

At birth the mucous membrane in the mouth affords the same protection as in the other parts of the body. As each tooth is erupted, a hole is punctured through this protective covering, in all, thirty-two holes. Although the tooth fills this opening, the margin is always open, as long as a tooth is standing in the jaw. In other words, the mucus membrane is not attached to the tooth, and leaves, as it were, a crack into which the flora and parasites of the mouth are free to

enter. Where the mouth is in a healthy condition, this crevice is very slight, but the dirtier the mouth, the wider it becomes, with an increasing load of infection. Thus it is easy to see why extraction of a Pyorrhea tooth seems so quickly to cure. The irritant being removed, further protection takes place on account of the mucus membrane closing over the opening where the tooth stood.

We must bear in mind that an edentulous jaw never presents a pyorrheal condition, and that the extraction of the affected tooth or teeth affords relief for that part of the bone. This is even so when the process has become carious in the advanced stages. This leads us to believe that the pathological condition is centered around the tooth root and its attachment to the bone.

THE ALVEOLAR PROCESS.

Tolbot in his well-defined theory would have us believe that the alveolar process is of a different structure from the rest of the maxilla, and that it is a transitory structure whose only purpose is to mould itself about the teeth, and, when they are lost, to be absorbed. His experiments and arguments have been largely accepted by the dental profession. The author is of the opinion that the alveolar process is in no way different in its characteristics and structure from the rest of the bone, and that the socket is simply a medullary space, situated in an extension of the maxilla.

If the initial infection is not removed, the part follows the usual course of infection and inflammation. As this condition progresses, the tartar and infection continues to collect on the teeth and gums until it results in alveolar pyorrhea and we have pus pockets. Now in the event this infection is not removed, the bone begins to liquify, constituting alveolar caries, and finally the teeth lose their attachment and become exfoliated. (Fig. 85.)

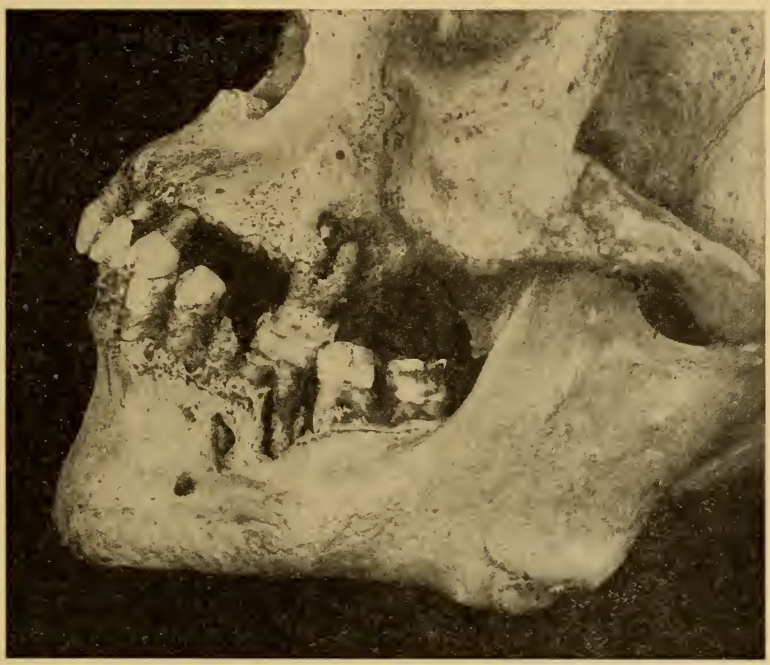


FIG. 85. This picture was made from a skull carefully selected from some two hundred skulls. This specimen exhibits many of the various factors in pyorrhea. The cut fails to show the value of the skull. Salivary and seruminal calculus, all degrees of alveolar destruction and eroted roots are present. (From author's collection.)

In the true sense of the word *necrosis,* from a medical standpoint, can not properly be applied to the molecular disintegration of the alveolus in pyorrhea. Certainly, we do not have any considerable bone dying in masses, thus the process is more of the character of *carious* bone. However, *necrosis* is in common usage among dentists in describing this condition.

Dr. F. C. Pague reports to the author a most interesting case bearing on the restoration of the alveolar process. This case is worthy of close study.

"I am presenting for your consideration the history of a case with X-ray photographs (Fig. 86) of same that will

prove to the doubting Thomases of the profession a fact that I have had convincing proof of for years, namely, that nature will and does build in and around the roots of the teeth new constructive tissue, where the bony process has been lost through or by the deposits of seruminal calculus on the roots of the teeth, providing said deposits are all carefully and fully removed and the surfaces of these roots are smooth and polished, and that such teeth thus treated will become firm and strong in their sockets, and be immune to a return of such conditions if patients will but do their part in keeping the surface of their teeth clean and polished and faithfully attend to the subsequent treatment in way of periodical prophylaxis at intervals of two or three months."

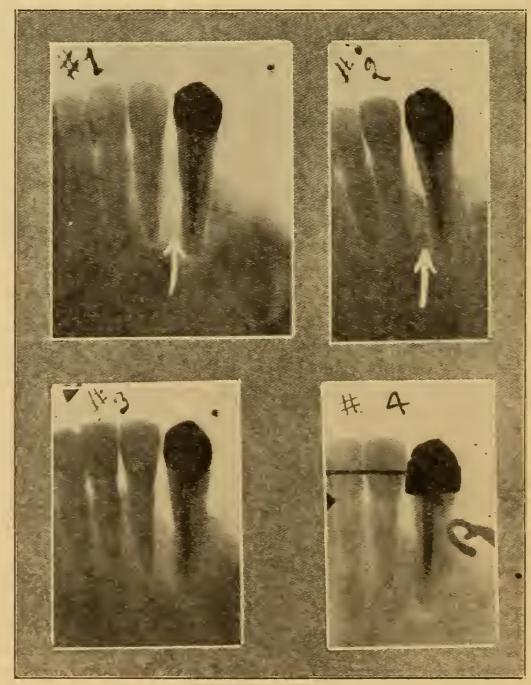


FIG. 86. After proper measures the alveolar process rebuilt between these teeth. (Pague.)

"The case is that of a young woman thirty-two or thirty-three years of age who lost both bicuspids and first molar on the lower left side and had after a time a bar bridge placed to take their place, the bridge extending from the second molar with a gold crown for posterior anchorage to the cuspid for anterior anchorage, the pulp being removed from the cuspid and the anchorage made by placing a gold backing lingually supported by a platinum pin extending well into the root canal, but because of imperfect occlusion the strain became too much for the cuspid and after a few years a pyorrhea condition developed that necessitated the removal of the bridge. Treatment for pyorrhea followed. When the case was presented to me for treatment I found the process between the cuspid and lateral all destroyed, extending to the apex of the cuspid mesially, while the lateral appeared suspended in a pocket of pus, for a pocket extended to the apex of the lateral on the mesial surface as well as distally, with concretions of deposit on the roots of both teeth so dense it appeared almost impossible to remove it, and get the surfaces smooth and polished. The X-ray photograph (No. 1) taken immediately following treatment (April 27th, 1914) shows clearly the loss of process between the cuspid and lateral and central incisor, and also how the lateral is without apparent support for the deposits were found on its apex. After the root was cleaned the rough edges of the process were curetted, leaving the tooth in rather a critical condition. Under ordinary circumstances these teeth would have been splintered immediately by a very light linen thread No. 100, but the patient was to pass into the hands of an orthodontist to correct a general imperfect occlusion, and so I thought best to leave the teeth without any support, the patient assuring me she would use the opposite side of her jaw for mastication, and endeavor not to touch or move the teeth. X-ray No. 2 was taken about four

months after No. 1 (August 15th, 1914) and in that can plainly be seen nature's effort at reconstruction. How she is filling in new tissue between the central and lateral incisors and how she is struggling to fill in between the lateral and cuspid, but you will observe the reconstruction is higher and more dense towards the lateral than the cuspid, and a small spicula of bone is reaching out along or close to the lateral with a sloping off with a lighter shade towards the cuspid, and this illustrates the difference between a vital tooth and one that is not. The heavy dark outline in the cuspid represents the gold backing on the lingual surface and platinum pin, with a lighter shading in the canal beyond the pin which is the gutta purcha point or filling. Nature is far more rapid in its upbuilding of new tissue about the root that is vital than one that is not, but while some writers contend that nature will not rebuild lost tissue about a devitalized tooth, I can hereby prove as clearly as one can discern white from black, that she does build in the same way (only more slowly) reconstructive tissue and that a devitalized tooth will become as firmly set as one that is vital. For proof of this assertion examine X-ray No. 3, taken December 7th, 1914, a little less than four months later than No. 2. No. 4 was taken March 29th, 1915, and shows the regulating appliance in position. The orthodontist has been at work and these appliances have been in place more than three months. An inflamed area is disclosed at the apex of the cuspid with some breaking down of new tissue which is not to be wondered at, considering the movement that has taken place, but with positive retention nature will quickly correct this condition and the upbuilding will be more rapid, certainly a remarkable showing, and surely a convincing proof to the unbeliever in the successful treatment of pyorrhea by instrumentation. No vaccines or stimulations of any sort has been used to assist nature in this upbuilding. In fact, I am

rather prejudiced against such treatment, my contention being that if all the deposits are removed nature will rebuild new tissue between the roots, the same as in any other part of the body, but the area must be clear of all irritation, not only of deposits on the roots but neucrotic tissue in the affected area, care being taken to currett all rough edges of the process."

Sometimes the process rebuilds around the teeth which have been operated on, but in most cases it does not so favor us. All we can do is to make conditions favorable for its rebuilding. This is best done by the following, Fletcher's method, in dealing with the alveolus. This curetment gives a beneficial bleeding and starts the bone cells toward growth. We may not get complete obliteration of the pocket but we have a filling in which holds the tooth much firmer than before the operation. Some investigators are now at work on this problem and progress is being made. In other locations in the body, bone dust can be used successfully to fill in lost bone, but the conditions for re-infection here are against this experiment.

TOOTH ROOT ABSORPTION.

Often on failure to restore a tooth by treatment, we extract it and find the end absorbed, leaving a rough margin with small sharp projections. (Figs. 81 and 87.)

I wrote to Dr. T. B. Hartzell asking him to answer the following questions relative to the absorption at the end of the roots of teeth, especially with respect to the lower central and lateral incisors:

1st, Why is it that these teeth are more prone to root absorption than other teeth?

2d, How does it occur and leave the teeth alive?

3d, Is it the same process that occurs with the temporary teeth?

4th, Is there any way of diagnosing probable root absorption before it takes place?

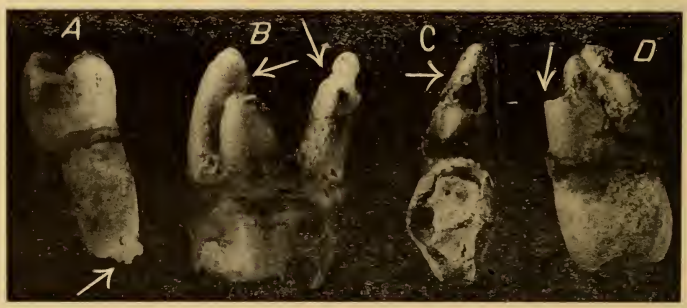


FIG. 87. Eroded teeth in pyorrhea. (C) Tooth treated with acid until it was like chalk when extracted. This treatment evidently caused the cavity in root for the pocket was in lingual side. (From author's collection.)

In answer to these questions Dr. Hartzell wrote me as follows:

"The process of root absorption in teeth that have lost bony support is largely due to movement, which stimulates osteoclasis. My experience with those teeth is that the more rigid they are held in position, the less root absorption. Of course there is a certain amount of irritation from bacterial poison in all cases, which added to the physical movement, further stimulates bone destruction by making perfect the conditions for absorption.

"Did you ever see the two ends of a broken bone in which you had a false joint finally established? The ends of such bones are rounded and resorbed back. This is the same thing which occurs in the socket about the end of a tooth that has movement, and also is the same process which destroys the root end.

"No, it is not the same process that occurs with the temporary teeth. That is a normal physical condition, and the process is stimulated in the case of temporary teeth through the irritation by the uplift of the permanent teeth against the deciduous root end, and happens long before any movement can occur in the tooth by reason of its shortened root and without infection.

"Yes, root absorption is always probable where there is considerable movement established or where infections are resident in the tissues around the root end."

Dr. Hartzell did not answer the second question, nor has anyone else, to my satisfaction. The answer to the fourth can be deducted from his remarks. Stop movement by treatment and splint.

FORMATION OF PUS POCKETS.

The result of irritation to the gingival tissues produces an exudation in the gum tissue. This exudate becomes septic through the action of the bacteria of the mouth, forming pus; suppuration destroys the adjacent alveolus, forming the so-called "pockets."

In the early stages, the extent or depth of a pocket on the tooth root is indicated by a reddish area on the gum. As the disease progresses and becomes chronic the color changes to a purplish hue. The color of the pus from the reddish area is yellow; that from the chronic or old standing is mixed with stagnant blood and is dark blue, purplish or black in color.

Black has said that the human teeth bear something like 1700 pounds of pressure each day. If we will liken a tooth in its socket to a piston working under a heavy load, we will see how easy it is for bacteria and its products to be forced into the broken blood vessels found here and the cancellous structure of the jaw bone. Estimating the infected surface

of a Pyorrhea case, we are surprised to find its extent from three to seven square inches. In addition to this, if we will compute the quantity of pus and other poisonous products excreted and swallowed daily by the average case of Pyorrhea, something like a half teaspoonful will be a safe average. The wonder of it all is that nature can provide immunity against such odds. You can safely tell your patients, however, that just so surely as they are not immune from death and taxes, sooner or later, they are to suffer from this gradual pumping into the system and swallowing of these poisons. Goadby, one of our best authorities in his "Mycology of the Mouth," has said: "Small but considerable dosage with bacteria and products from a local focus tends to gradually break down immunity."

ALVEOLAR ABSCESS IN PYORRHEA.

A narrow constricted pocket may become suddenly very active or the exit from any pocket may become blocked to form a pyorrheal alveolar abscess. The swelling may have some of the appearances of the ordinary alveolar abscess from a decomposed pulp, and is often mistaken for such.

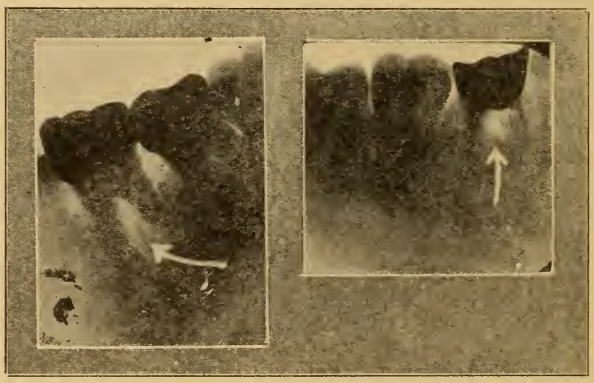


FIG. 88. Typical alveolar abscesses. Note absorption of root end in first picture. Someone answer why this occurs so often at tip of root rather than other parts of the tooth. (Author's case.)

Smith has called our attention to the diagnostic points in differentiating pericemental abscess and pyorrhea.

Pericemental abscess is not the result of putrescent pulp tissue, but on the contrary, it generally occurs on live teeth between the bification or at the end of fused roots. The pain is not severe but continuous. There are no inflammatory symptoms. The discharge of pus is small, oozing to the surface of the gum margin; it never forms fistulae like a pulp abscess. On extraction these teeth present small globules of pus having no confining membrane. (Fig. 88.)

The constitutional symptoms are very severe as compared with the severity of the pathological condition. Nervous oppression, indigestion, malaise or headache may result from the absorption of pus from these abscesses.

Smith claims that pericemental abscess is not a state of pyorrhea although they are often associated in the same mouth. The abcess develops in some inaccessible depression between bicuspids or molars, while pyorrhea is found on straight-rooted teeth. Smith further claims that teeth affected with abscess can not be cured except by extraction.

The soreness, looseness and pus discharge from this class of teeth are often mistaken for pyorrhea, and consequently unsuccessfully treated.

Differential diagnosis between pulp alveolar and pyorrheal alveolar abscess:

PULP ABSCESS.	PYORRHEAL ABSCESS.
Only on dead teeth.	Generally on live teeth.
Comes on gradually.	Appears in a few hours.
Severe throbbing pains.	Pain not so severe.
Swelling extends over considerable area.	Swelling localized on one tooth.
Color, bright red.	Color, generally purple.
Location, near root ends.	Location, near cervical border of gums.

Other points connected with the pathological anatomy are intimately associated with and described under the following pages.

CHAPTER XXV.

SYMPTOMS, DURATION, AND DIAGNOSIS OF PYORRHEA.—THE VALUE OF THE RADIOGRAPH IN PYORRHEA.

SYMPTOMS.

As we said in the definition of pyorrhea, it is of slow onset. So slow is it that a patient may have it for years and be unaware of his condition until a dentist tells him of it. On the other hand, it is a sleeping volcano, liable to break out at any time. Suddenly, some day the gums begin to swell and the volcano breaks forth with an alveolar abscess. You will find that in the incipient stage the patient stops brushing his teeth because the gums are painful and bleed. In the latter stages you will find the exudation of pus, and the teeth becoming loose.

The symptoms are sometimes so mild that it is difficult to diagnose the condition until you have made a thorough examination. A physician once referred a case of pyorrhea to me and I reported that I did not think the case serious. I failed to make the proper examination. When I operated, I found the condition serious in that the alveolus was almost disintegrated.

To know the early signs of the disease one must be very familiar with them and always make a careful probing examination. The patient may have had pyorrhea before he got into the habit of brushing his teeth, so that when he comes to you his teeth may be in a clean condition, thus somewhat covering up the septic picture and deceiving the examiner.

A rather common symptom of advanced pyorrhea is a separation of the teeth, destroying the contact points and

FIG. 89. Pocket on one side of tooth showing separation of tooth toward the side where the peridental membrane is still attached. (Author's case.)

giving entrance for food impaction. The peculiarity of this separation is that the affected tooth bears away from the point of infection or pocket. At first glance it would seem that the tooth would fall over on the weakened side. If we imagine the tooth to have rubber bands on both sides, each pulling the tooth in the opposite direction, should one be cut, we know that the tendency of the tooth would be to move toward the side where the rubber remained. Now the peridental membrane or ligamentous fibres are the elastic bands which draw the tooth away from the side where pyorrhea has weakened the "sling." (Fig. 89.)

Mal-occlusion is almost a constant symptom and result of oral sepsis. It seems that the teeth are constantly changing their position in pyorrhea. One patient had a lower cuspid which had turned half way around. Another patient had such a wide separation between the two lower centrals that a bridge with two extra teeth was required to fill the gap. The result in such cases is to destroy the proper occlusion.

One of the most constant symptoms of pyorrhea is the odor coming from the pus, which is similar to that from a diseased antrum. You instantly detect this odor as soon as

the patient opens his mouth, and you will soon learn to know it. The odor is characteristic.

The patients will nearly always tell you that they brush their teeth from two to six times per day, and that they can not understand why their gums should give them any trouble.

The slight general symptoms are not nearly what we might expect from such an amount of infection; we are surprised to have some of the patients state that they suffer no other than local mouth symptoms. In other cases they have attacks of indigestion and have probably been treated by a stomach specialist.

The patient may exhibit the symptoms of various other diseases connected with the eye, throat, heart or kidney which may be traced to mouth infection from pyorrhea.

DURATION.

The duration of pyorrhea is very uncertain. The incipient form, so called gingivitis, may run along many years before developing into the more severe types. When an infection of long standing does begin to make inroads into deeper structure, the progress of the disease is very rapid. There are many factors as to health, local mouth conditions and character of infection or inflammation which affect the duration.

Individuals who have healthy mouths and who ordinarily give proper regard to dental toilet may for some cause, such as sickness or severe grief, entirely omit any care of their mouths. This lowering of vital resistance together with the omission of cleaning the mouth will produce a pyorrheal condition giving a history of rapid development. In so short a time as thirty days such a case may exhibit bleeding gums, pus, and loosened teeth.

A recent case was that of a young healthy girl of sixteen years who, inside of six months, developed such a severe

pyorrhea that one tooth dropped out into the spittoon while making the examination. It would have been a safe guess to say that in six months more she would have lost many of her teeth. This case yielded promptly to treatment with the exception of lower central and lateral, which were bridged.

On the other hand, just the opposite history of duration is often met with. Patients often answer that they have had diseased gums from ten to twenty years.

From these observations it will be seen that there is no regular rule as to the time required for pyorrhea to run its course to the stage where there is exfoliation of the affected teeth. This much we do know; it never gets better spontaneously without treatment, but always, whether gradually or rapidly, is sure to continue to grow worse.

DIAGNOSIS.

Dr. Younger has written that "fully ninety-five per cent. of the Anglo-Saxon race have pyorrhea in some stage of development in one or more of the alveoli. It is common among all races in all countries, and among all classes. The rich and the poor, the well conditioned and the mean, the vegetarian and the meat eater, the bibulous and the abstemious, the fat and the lean, the robust and the debilitated, the strong and the weak are all affected. Neither does temperament seem to produce immunity, for the nervous, the sanguine, and the phlegmatic suffer from it."

I am sorry to say that even though the proportion is large many dentists who are accustomed to making diagnoses of carious conditions are not able to diagnose a pyorrhea case. Patients often complain that the dentist did not tell them that they had pyorrhea. Some dentists may at times recognize the condition but not attend to it. In other cases the disease has not received the proper treatment, meanwhile growing worse, and valuable time is lost before

FIG. 90. A typical case of pyorrhea alveolaris due to simple neglect. The engraving does not show the dark blue color of this congested gum. The serumal calculus in this case is as hard as the tooth structure. Very little pus present and teeth all firm.

the patient is finally referred to a dentist or specialist who can cure pyorrhea.

The time is passing when a well informed dentist will limit his diagnosis of pyorrhea to what he sees in the mouth. Dr. Arthur H. Merritt wrote me recently that he believes "still more attention should be paid to the general health of patients, and very careful histories made, such as urinary analysis, blood counts, (including a differential), blood pressure, Wasserman test when syphilis is suspected, radiographs, etc. Constipation seems to be associated with bad pyorrhea conditions and should be looked for and corrected."

Often grave responsibility is attached to our diagnosis. For instance, Anglii calls attention to cases of ulcerative gingivi-stomatitis due to Vincent's bacteria. These cases are

said to have a close resemblance to diphtheria, while the mouth complication may be pyorrhea. This infection is found between the teeth or in inaccessible places. The interproximal gum tissue and alveolus undergo a quick necrotic destruction. The diagnostic points are: the gray color which when rubbed off leaves a bleeding surface which will reproduce within two hours much pain and loss of gum festoon. Positive diagnosis must be made by microscopical examination.

Some other conditions with which we should be familiar in making a diagnosis are syphilis, leucoplakia and tuberculosis. I will not go into a detailed description of these diseases; but just a point or two is given bearing on the diagnosis from pyorrhea. The initial lesion of syphilis produces a round oval nodule on lip or tongue which in color resembles that of boiled ham. The size may vary from that of a large pin head to a ten cent piece. They are always painless and indurated. In syphilis itself the alveolus may come away as a sequestrium because the circulation is cut off to such an extent that the pulp and surrounding structure may die. In diagnosis we must contrast this rapid destruction with the slow disintegration of the alveolus from the gingival border towards the apex which we find in pyorrhea.

Leukoplakia is a rare condition, but should be suspected if gums and cheeks present small, pale colored patches which are slightly indurated.

Tubercular conditions are likewise of rare occurrence in the mouth. When present, we have small yellow granular nodules which are located mostly in the posterior part of the mouth and pharynx.

In making a diagnosis of pyorrhea, we must not only know the physical symptoms but go beyond the mere mouth conditions. As suggested by Dr. Merritt the general history of the patient must be taken into account when a diagnosis is given. By the routine use of a history chart many

interesting and valuable facts for the diagnosis of pyorrheal conditions are brought out which will have a bearing on the treatment.

THE RADIOGRAPH IN RIGGS' DISEASE, BY ALONZO MILTON NODINE, D.D.S.

"The use of the X-ray as a means of diagnosis in cases of pyorrhea alveolaris is quite as essential, quite as valuable as in any other field of dentistry. That the X-ray is not more generally used by those who are making the treatment of this disease their special work is to be deplored. If specialists realized and appreciated the vast amount of doubt, disappointment, dissatisfaction, mistrust and wasted effort for which the failure to employ the X-ray is responsible they would not have that unbounded faith, which they now have, in their unassisted visual and digital examinations.

"As a form of treatment, the X-ray has doubtful, if any, value. The mode of application to any part of the mouth, except to the incisors and canines is fraught with such difficulties as to be impractical were it desirable to use them. The element of danger in the continued treatments with the X-ray also precludes their employment for the treatment of this disease. Taking everything into consideration, the chief and perhaps the only value the X-ray has in the field of the Riggs' Disease specialist is the taking of the radiographs for diagnostic, record, and research purposes.

"That the X-ray is an infallible guide must not be entertained for a minute, but all symptoms, signs and hints, taken in conjunction with the radiographic examination, will make the diagnosis more clear and positive.

"The most apparent use to which the X-ray may be applied is to find out the amount of bone destruction or absorption about the roots of the teeth afflicted with Riggs' Disease. Instrumental examination is about as exact and certain as the complete filling of root canals without a radiograph.

How certain that is, may be judged from the fact that less than five per cent. of the roots into which root canal fillings are placed reach the apex.

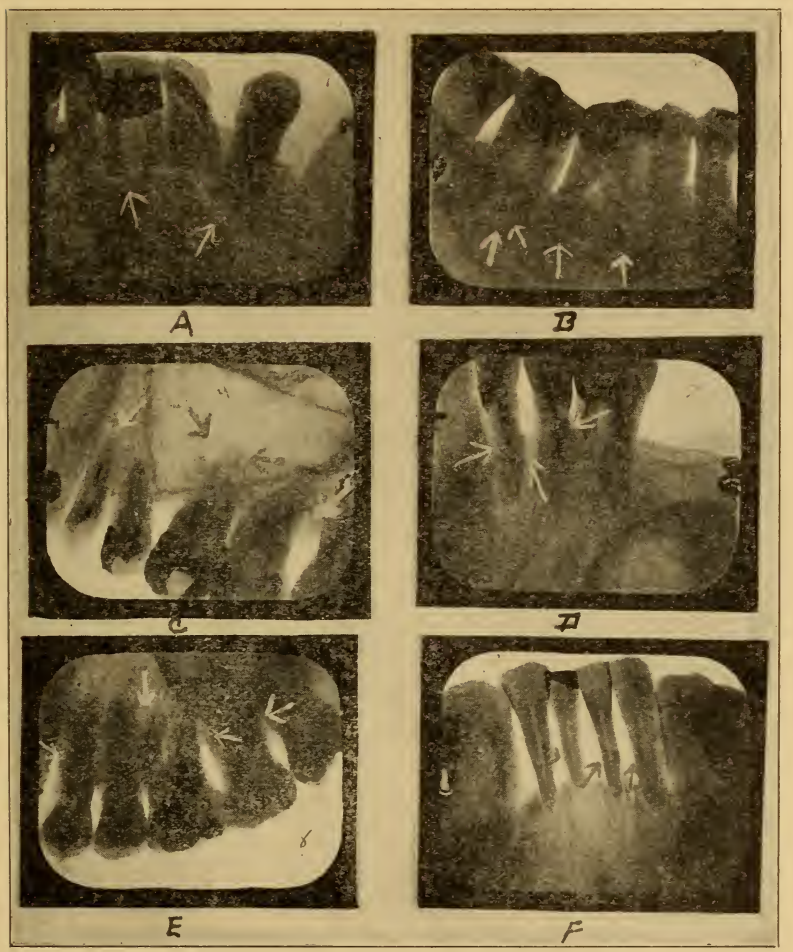


FIG. 91. (A) Case of pyorrhea showing absorption of roots, complicated with apical abscess. (B) Case with extensive absorption complicated with periapical abscess. (C) Apical abscess on palital root of first molar, apical infection on first bicuspid and eroted root of first bicuspid. Note extensive pocket between scond and third molars. (D) Pyorrhea with excementosis. (E) Pyorrhea, excementosis and eroted roots. (F) Excessive absorption of bone also showing deposits on roots. (Nodine.)

"The radiograph will not only show the amount of absorption of the alveolar bone, but will, within certain limits, show the state of the attachment between the alveolar bone and the tooth. It will also show the length of the root and the amount of leverage it may stand.

"How great a help this is will be well understood by those who have treated cases of Riggs' Disease, believing, from examination without the X-ray, that there was sufficient alveolar bone about the tooth to justify its retention or that the tooth was sufficiently long or strong to withstand leverage, or that the attachment between the bone and the tooth was sufficiently secure to yield to treatment; then after the most expert instrumentation and medication the teeth came out within a short time!

"The most common mistake made by those who treat Riggs' Disease without using the radiograph is that of treating chronic alveolar abscesses for Riggs' Disease. The number of cases in which chronic alveolar abscesses discharge their pathological contents between the proximal surface of teeth is exceedingly great. And this simulates Riggs Disease so closely that it is a continual puzzle to those who treat this disease why such teeth fail to respond to treatment. This condition of affairs is not confined to the anterior teeth or bicuspids, but also includes the upper and lower molars.

"The presence of undiscovered blind abscesses is also another condition that confuses both the diagnosis and the treatment of Riggs' Disease. Such teeth having lowered both the systemic and local resistance, the efforts of the dentist to restore normal tooth function and overcome the general infection, supposedly due solely to the Riggs' Disease, are defeated and nullified by the constant and insidious infection produced by these apical abscesses. This suggests that any teeth to which are attached caps, crowns or bridgework, or any devitalized teeth should be subjected to radiographic examination prior to treatment.

"The frequency with which, after prolonged treatment and supposed cure, teeth come out, whose roots are absorbed or eroded, is another state of affairs that the radiograph would largely have foreseen. The wasted effort, the disappointment and dissatisfaction for which this is responsible is very great. Roots whose apicies are as sharp as pins, roots which have been eroded or corroded, are left in the mouth to be a continued source of infection and irritation. They are beyond the hope of cure, and delay the restoration of healthy conditions about teeth which may be saved.

"Not a few teeth about which Riggs' Disease is exerting its malignant influence have undergone the process of excementosis. The extent of this excementosis often is so great that it calls for the extraction of the tooth or teeth. The difficulty of treatment, and confusion that such an added pathological condition entails on the dentist makes this one of the most serious problems that confronts him.

"Since the treatment of Riggs' Disease resolves itself into a re-organization of the mouth, and an attempt to restore function to as near normal as possible, the employment of the radiograph will be found to be the most valuable and trustworthy guide we have to help attain this end. It is a continual surprise and wonder to those who now use this agent as a diagnostic help to find those unsuspected and strange conditions which only the radiograph or autopsy could reveal.

"Hundreds of radiographic examinations by the writer force upon him the conviction that he and others who hitherto have not used the radiograph have been indulging in some very wild speculation and guesswork. This has entailed a vast amount of useless effort, and, in many cases, harmful effort.

"When we review the great number of conditions that may produce chronic irritation and lay the foundation for Riggs' Disease, it will be realized that a radiograph exam-

ation is of such value as to be almost indispensible for anywhere near a proper diagnosis.

"At first thought, we have such confidence in our ability to see with our eyes and feel with our fingers that the X-ray seems unnecessary. But even the most expert fail to find, and often overlook, what the X-ray does find. The greater experience one has had with the X-ray, the more convinced one becomes that one's ability to discover by any other means the conditions that the radiograph reveals is greatly overestimated.

"It is only necessary to name some of the things which, in the treatment of Riggs' Disease, have been overlooked by the eye and the instrument! For example, pieces of tooth pick, gutta-percha, amalgam and cement pushed up between teeth, broaches, bits of broken instruments, ligatures, and rubber-dam have been found: perforated roots with the post of a porcelain crown sticking out, lost or forgotten roots and impacted teeth causing chronic and persistent irritation.

"Often, with all conditions quite right, as the tube, exposure and angle of the rays, it is possible to find deposits on the roots and pulp stones in the canal.

"It is quite advisable, if not necessary, to have a radiographic examination before beginning treatment as part of the diagnosis. It is also well, after the treatment is completed, to again examine with the X-ray as a matter of record. After a year or two it is quite interesting to again examine with the X-ray to find out if regeneration of the bone has taken place."

CHAPTER XXVI.

PROGNOSIS.—BLOOD PRESSURE.—ARTIFICIAL TEETH IN REGARD TO PYORRHEA.

PROGNOSIS.

The questions that patients ask the dentist when informed that they have pyorrhea are, "Can you cure it, Doctor? Will it stay cured? Do you guarantee a cure?"

To the last named question the dentist should always be prepared with an answer and, though he might gain a little more business by saying that he could guarantee a cure, still the time may come around when he will regret having told the patient this. One dissatisfied patient can do a dentist a great deal of harm. He should be told that to "guarantee" is only to make use of a catch phrase used by dental parlors and shyster physicians. Patients would not think of asking a physician to guarantee a cure of typhoid fever or grippe or ear trouble, before accepting his services. The patient with pyorrhea must understand that there are so many conditions on which our success depends that a cure can not be guaranteed. Then again, we are not in the insurance business; nature could not make teeth with a guarantee that they would stand, certainly we should not be expected to. One way to get out of all arguments of this question is the method I use in my office. On the examination sheet, I have printed at the bottom the information that "we do not guarantee any operations." The patient at once sees this and all questions along this line are generally avoided.

To the query, "Will it stay cured?" we can answer a little more definitely. If we have diagnosed the case properly, and accepted it, we can tell them with some degree of

certainty that where the proper degree of oral hygiene is carried out, and where repeated visits at stated intervals are made to the dentist, for the purpose of having the teeth cleaned and polished (systematic prophylaxis), that they should not only stay cured but the condition of their mouths should improve with every visit to the dentist. In other words, if the operation is successful, and the patient masters the proper technique of keeping the teeth and gums in good condition, the mouth conditions should improve all the time.

The nose and throat specialists will not tell you that they cure catarrh. They cure the local conditions, the patient gets along nicely, until he exposes himself or contracts a cold, then he is in the same condition as before treatment. Now, the same analogy applies to the treatment of pyorrhea. We certainly can cure the condition, and, as long as the patient carries out our instructions, he will get along fairly well, but if he fails at any one point, he loses out, still, we are in the same position as the Rhinologist, we can cure it again. The only difference is that the patient will gladly pay again for medical treatment, but thinks that a return of Pyorrhea is entirely on account of failure of the first treatment and expects all future treatments free of charge. This is not a rare experience by any means.

The question as to the curability of pyorrhea is one which has been freely discussed by dentists, and on it has hinged much of the criticism of experts and specialists in pyorrhea. If you mean by "cure" that the bony structure will rebuild and will be restored to its normal bulk around the teeth, if you mean that the gums will grow back to their normal position at the juncture of the enamel and root of the teeth and with the same degree of firmness as heretofore, and if you mean that the patients will be able to go as other people with just ordinary care of their mouths, then we would have to admit that a real case of pyorrhea alveolaris is never cured. Of course, in mild and incipient cases of pyorrhea,

all this does not apply, but we are referring to the more advanced case. Remember, in giving your prognosis, that the patient expects the gum tissue to grow up to its original position at the juncture of the enamel and the dentine, therefore it should be explained that the gums will probably shrink from the teeth even more, for this is one result of a successful pyorrhea operation in that tumefaction is reduced.

In answer to a question about the cure of alveolar pyorrhea Dr. Arthur E. Peck writes:

"If the treatment for pyorrhea has been thorough and the removal of pyorrheal deposits has been accomplished, the case is then cured. The burden of maintaining a cure after the treatment of pyorrhea rests largely with the dentist. The hearty co-operation and support of the patients must be secured. They should be taught how to keep the teeth and gums clean and healthy. They should be impressed with the importance of having a prophylactic treatment at certain intervals. This prophylactic treatment requires as much skill or even more than the original treatment of the case, as the slightest particle of returning deposit must be removed and to detect this small particle tests the ability of the most skilled operator. The loose teeth must be made immobile either with pyorrheal splints or bridge work. The occlusion must be so regulated that undue pressure will not be brought on the affected teeth. If these few instructions are followed accurately the prognosis is good for a cure in nearly every case where the bony support is sufficient to prevent the tooth from being easily rotated or from cushioning on pressure."

The question as to the curability of a given case is one which depends a good deal on the individual skill of the dentist. A case may be incurable in the hands of one practitioner and easily cured by another, who is more skillful in the removal of pyorrheal conditions.

By proper treatment, pyorrheal conditions can be healed, the tumefaction of the gums and soreness of the teeth can be made to disappear. The shedding of the teeth, flow of pus, elongation of the teeth, recession of the gums, carious action in the bone and its resulting odor can be obliterated. These are the benefits to be derived from the treatment of diseased gums. Not only this, but we can also prevent other teeth in the same mouth from becoming infected.

In regard to the curability of pyorrhea, Dr. Hutchinson says:

"The great majority still believe it to be incurable, and progress is being seriously hampered by the influence of those who persistently refuse to believe what some of us know to be true. . . . The fact that the majority have failed in their efforts to cure pyorrhea has had greater weight than the successful effort of the few. . . . I have frequently been told by patients that some friend of theirs, at their solicitation, had intended to have treatment for pyorrhea, but had abandoned the idea because the dentist had told them that it was a constitutional disease and could not be cured. No man has the right to deprive the patients of a benefit because he either can not render the service or is ignorant of the fact that it can be rendered. . . . If any practitioner fails in his attempts, he must not conclude that a cure can not be effected. If he fails, there is a good reason for it, and he may succeed later on."

The dental profession has been responsible for the loss of thousands of teeth just because so many dentists have told their patients that there is no cure for pyorrhea. If dentists have such large practices that they do not care to take time for the treatment of these cases, it is well for them to know that other men in the profession are making a success of this work and that from 75 to 85 per cent. of all cases of pyorrhea are being cured and stay cured under the care of these operations. I do not make this statement from mere

hearsay nor from what other men have written. In addition to my own experience in treating these cases, I have been in the offices of other specialists and have seen numbers of patients who have been cured. This will be discussed again at full length; but let no dentist be again guilty of saying that pyorrhea operations are failures, for it is up to us and up to the dental profession to stop this horrible increase of oral sepsis.

The following extract from a paper of Dr. A. H. Merritt gives in a concise form the prognosis of pyorrhea and what we can do and expect in our treatment of mouth infections:

"Pyorrhea is a preventable disease, probably the most easily preventable of all those occurring in the mouth. It is also a curable disease, though every case will, if long enough neglected, reach an incurable stage. The prognosis, therefore, depends largely upon the stage to which the disease has progressed.

"Inquiry should always be made regarding the patient's general health and habits of life. In all cases where a constitutional relationship is suspected, a careful physical examination should be made, and the co-operation of the family physician sought. With our present limited knowledge of these relationships, dependence however must be placed upon local treatment. When this is skillfully done, the results are most gratifying. The discharge of pus ceases, the gums resume their normal color, the teeth tighten in their sockets, and the patient is able to use them more or less freely. When not too far advanced, the disease can be permanently cured by such treatment.

"There are, of course, incurable cases, and what is more frequent, teeth that are incurable in mouths where many of the teeth are only slightly involved. It is not always easy to determine when a given tooth is incurable, and the attempt is often made to save such teeth with discouraging

results to both dentist and patient. When in doubt, the tooth should be radiographed.

"When the dental profession realizes that pyorrhea is a preventable disease; that in its early stages it is easily and permanently cured; that only those cases are hopeless that are long neglected; that no drug or vaccine ever will of itself cure the disease, and that dependence must be placed upon local treatment, they will have taken the first step towards the elimination from the mouths of their patients the chief of mouth infections."—(Taken from a paper read before the Massachusetts State Dental Society at Boston, May 6th, and published in *The Journal of Allied Dental Societies,* June, 1915.)

In giving our prognosis to the patient, we should bear in mind that the disease in the upper jaw is more amenable to treatment than in the lower. In the first place the structure of the teeth and jaw favor this and they are more easily operated on in the immovable upper jaw. In addition to this, they are not subjected to the movement of the muscles and are not constantly immersed in the re-infecting saliva. On the other hand, the prognosis should be much more guarded if the disease has taken hold of the lower jaw. Here all the secretions are constantly coming into the pocket that we are trying to heal, and it is difficult to keep the medicaments that we apply in place for any length of time so as to get their full effect.

If the patient can be operated on before any destruction of the supporting tissues, so much the better, but in those cases where this has occurred to any considerable extent, even though an operative procedure might for the time being tighten these teeth, it would be better to extract them at once.

On the question of bony support, Smith says:

"The permanent tightening of teeth which have been loosened from pyorrhea, is wholly dependent on the amount

of support remaining in the alveolus and the life of the cementum.

"If the destruction of the pericementum caused by the necrotic wasting of the alveolus has not progressed too far, the tissues about the loosening teeth may, by intelligent treatment, be made to close in upon the roots and thus to a greater or less degree, they will tighten in their sockets.

"Terminal alveolar tissue once necrosed and wasted can never be restored, this tissue can not be made to renew or build itself, neither can it be made to build around the roots of the teeth, therefore, the cure of pyorrhea is not necessarily followed by permanent and satisfactory tightening of all the teeth under all conditions."

Another point in giving the patient a prognosis will be the probable condition of vitality of the peridental membrane. If the disease is in such an advanced stage that this structure has become saturated with infection, or its nutrition is to any degree affected, the chances of our being able to make a complete cure are correspondingly lessened.

Dr. J. J. Sarrazin in "Items of Interest" for March, 1915, reports a case which ended fatally. In writing the author relative to this article, he says "this is the first certificate of death issued in this country (possibly in the world) where the original infection from Riggs' pockets was recognized as the primary lesion eventually causing death."

In case the teeth are loose, be guarded against prognosis. In other words, you can not always give a correct prognosis in such a case. If the tooth can be moved from side to side, it is not so bad, but if it has that "squashy" sound and you can move it up and down in its socket, the tooth might as well be extracted. The ends of these "squashy" teeth often look as if a rat had gnawed them.

When we find the tooth which can be raised up and down in its socket we are led to believe that there is little life in the membrane surrounding the tooth, and that the terminal

end is covered with spicules and burr-like projections. When such teeth are extracted, their ends resemble a log on which barnacles have collected. Other conditions might produce this loosening of the ligamentous attachment, as when the tissues at the apex of the socket have become so infected that the ends of the root undergo a process of absorption similar to the absorption of the temporary tooth. If either one of these conditions can be diagnosed beforehand, we can say with absolute certainty that the tooth can not be saved.

BLOOD PRESSURE.

Clinical medicine now demands that the blood pressure test be used in examinations to indicate renal or heart troubles. It is required in examinations for life insurance, army and police departments.

Only lately have dentists begun to realize its importance in regard to the diagnosis, prognosis and treatment of pyorrhea.

Blood pressure readings are useful to dentists because they give information about arteriosclerosis, chronic nephritis, uremia and plumbism. In these we find the pressure high while in the following named diseases we read a low pressure: anemia, diabetes, starvation and exhaustion.

The average pressure of males should be 120, at the age of 20. For each two years above, one millimeter should be added. Thus at the age of 30 the reading should be 125. In women we find all readings about 10 millimeters less.

Simple inexpensive instruments are now on the market and have proved their value in pyorrhea work.

ARTIFICIAL TEETH IN REGARD TO PYORRHEA.

Every dentist who treats pyorrhea is frequently met with the argument that "it is just as good to have a set of artificial teeth and much less trouble than trying to save these I have." Such a patient will often bring along a friend who

has a "perfect set of artificial teeth," and inasmuch as this friend may appear quite healthy, it will often take the best argument at our command to convince our patient that the restoration and preservation of the natural teeth is superior to any artificial substitutes. In the first place we will have to admit that artificial teeth are better than teeth and gums which are diseased and which are not being kept clean. But on the other hand, they must consider the mortification that they will feel when the teeth are extracted, the inconvenience of getting used to the artificial teeth and the danger of frequent breakage, and of having to stay indoors for days at a time while the teeth are in a vulcanizer for repairs. But greater than any other consideration is the fact that the biting force of artificial teeth is only about one-fourth of that of natural teeth and we know that proper mastication of the food is of the greatest importance in maintaining good health.

CHAPTER XXVII.

INSTRUMENTS FOR USE IN PROPHYLAXIS AND PYORRHEA WORK.

Dr. Riggs, of Hartford, is generally credited with being the first American to use instruments in the treatment of pyorrhea. The instruments he used were very large and crude. Some of his original shapes are still to be found in the supply houses.

Considerable evolution has taken place in reference to size and shape. From a very few we are now offered sets of instruments numbering several hundred.

Beginners should not be discouraged by the fact that pyorrhea specialists, though possessing large sets of instruments, often wish they had a still greater variety of shapes and forms. It is not advisable for the beginner to buy all instruments in any one set; he should select a small number and add to them as needed and as familiarity with the work demands. The success of pyorrhea operations does not depend so much on the particular style of the instruments as on the operator's familiarity and dexterity in their use. This is proved by the fact that many of the contributors to this book work with instruments made on different principles.

The dentist in beginning this work should select those instruments which he thinks will fit into the pockets he has seen and should not attempt to use the complicated instruments with crooks and turns, the purpose of which it takes experience to appreciate.

In making a selection of instruments we should bear in mind the delicate work required. In addition to being sharp and delicate the blade must be extra strong. Probably more is required from a pyorrhea scaler than any other surgical instrument.

Younger says, "If but one small speck is left, even though it could be framed in the point of a pin, the irritation and bacterial infection maintained by its presence would, I think, prevent the diseased surface from healing. It is in the detection and removal of these minute points that skill and delicacy of touch are so much required."

So difficult is the operation, and in order to become efficient and expert Dr. Hartzell said that on his infirmary patients he frequently scaled a tooth and pulled it out to see what had been done. Often he found tartar which had escaped his instruments.

Probably the best general class of instruments for this work will be those which are used with a push and those used with a pull motion.

The Allport and Kirk patterns are examples of the push motion while those of Tompkins and Hartzell represent pull motion. The Younger type has a point that can be used either push or pull motion. The file type was popularized by Smith. Nearly all complete sets now have some instruments with file points. The users of each variety of instruments make the claim of greatest efficiency and a minimum amount of pain to the patient in their use.

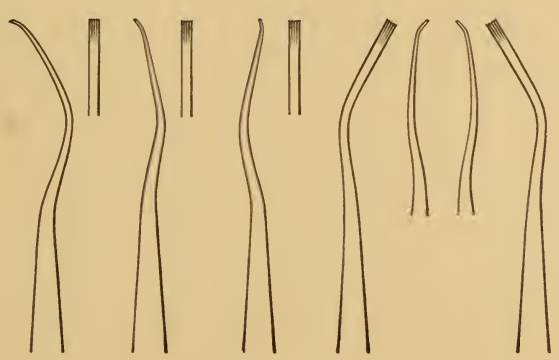


FIG. 92. THE KIRK DENTAL SCALERS.

The dentate edge prevents lateral slipping. After their use smooth-edged instruments should be used to make the surface smooth.

The Kirk dental scalers are excellent for removing the large deposits of salivary tartar. The claims for their use are a minimum amount of lateral slipping and wounding of the gums. They are not intended for deep pyorrheal conditions; but for dense masses of deposit. The wedge-shaped points on each blade cause the mass to break into small fragments which are thus loosened from their attachment. When used they must be followed by a smooth-edge instrument to remove the smaller particles and to smooth the surface. (Fig. 92.)

At the time when the push motion instruments were popular Dr. R. B. Adair revised the Allport type of blade and added others. This was the first set having the end of the blades concave on the cutting side to better adapt them to the contour of the root, while the back was rounded to prevent unnecessary irritation or wounding of gum tissue. (Fig. 93.)

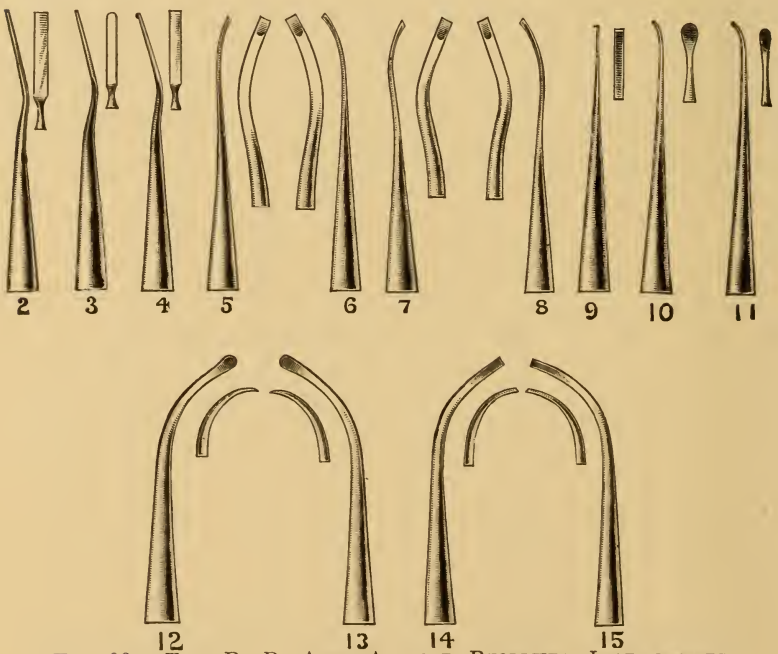


FIG. 93. THE R. B. ADAIR-ALLPORT PYORRHEA INSTRUMENTS.

The curved plane head was patented by Dr. Geo. Winkler. Dr. Gartrell, of Washington, introduced points with blades to work on the Japanese plane principal. Dr. C. W. Jones, of St. Paul, suggested having the points centered with the long axis of the handle. Also a method of sharpening the blades to prevent deep cutting. Dr. Carr took these ideas and classified the instruments into a set.

Dr. T. B. Hartzell has modified some points and by adding others has produced a most efficient collection. This set is probably too expensive for the general practitioner but for those who desire to specialize in this line of work it is certainly a good investment.

This suggestion is well expressed by Dr. A. C. Hamm: "I wish to disillusion the minds of many of the thought that ideal results can not be obtained without the use of the Carr instruments, and I draw this conclusion after years of experience with the use of these instruments, as well as those of other skillfully designed sets. Many of our most successful pyorrhea practitioners have never used these instruments, yet are accomplishing beautiful results. I mention this that the general practitioner may not deem it necessary to expend several hundred dollars to purchase instruments with which at least to treat the milder cases. It is the surgeon

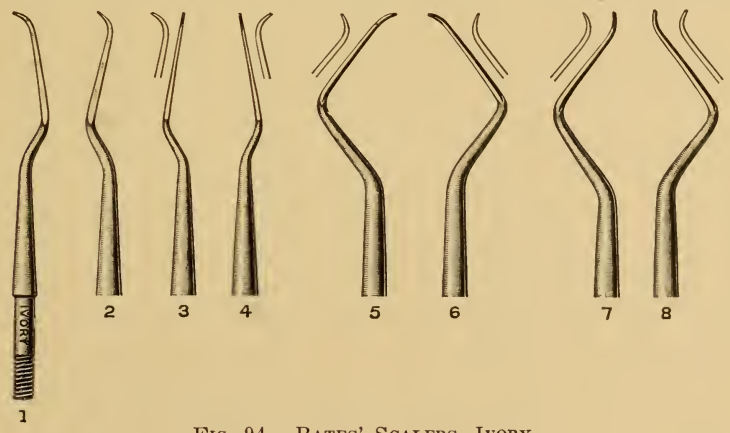


FIG. 94. BATES' SCALERS, IVORY.

and not the instruments that performs skillful operations, though instruments of proper design are essential."

Dr. A. F. James gives the following reasons for the adoption of the planing type of instrument:

"The writer contends that to be successful in this treatment, the operator must have developed or been taught some definite system of instrumentation that will make it possible not only intelligently to remove deposits of calculus from the root surface, but also to remove the dead pericemental membrane, exposing the root surface, without making scratches or grooves with the instruments. Also, he must have left a smooth root surface, without removing more than the outer layer of the cementum, under which will be found a denser cemental layer, which if not gouged or roughened by instruments, will afford a protection from further bacterial assaults and will allow the overlying gum tissue to settle closely about the teeth, preventing the lodgment of fermenting substances or the packing of food into pockets by the force of mastication. . . .

"It is not my intention to say that successful work can not be done with any particular set of instruments in the hands of a skillful operator; but I maintain that the ordinary scraping and filing instruments are often a cause of injury to the very root which we are attempting to benefit. With these scraping and filing instruments, of which the cutting edges are the only points in contact with the tooth, the delicacy of touch can not be attained which makes it possible to locate the small particles of deposit and know when they have been removed. Both with men whom I have watched use such instruments, and in my own hands, it has seemed to be an operation of bull-headed determination to remove the deposits, trusting to luck for smoothing the root, which is the final object to be gained.

"To illustrate this point, I will cite an incident which occurred following one of my clinics. An exchange of ideas

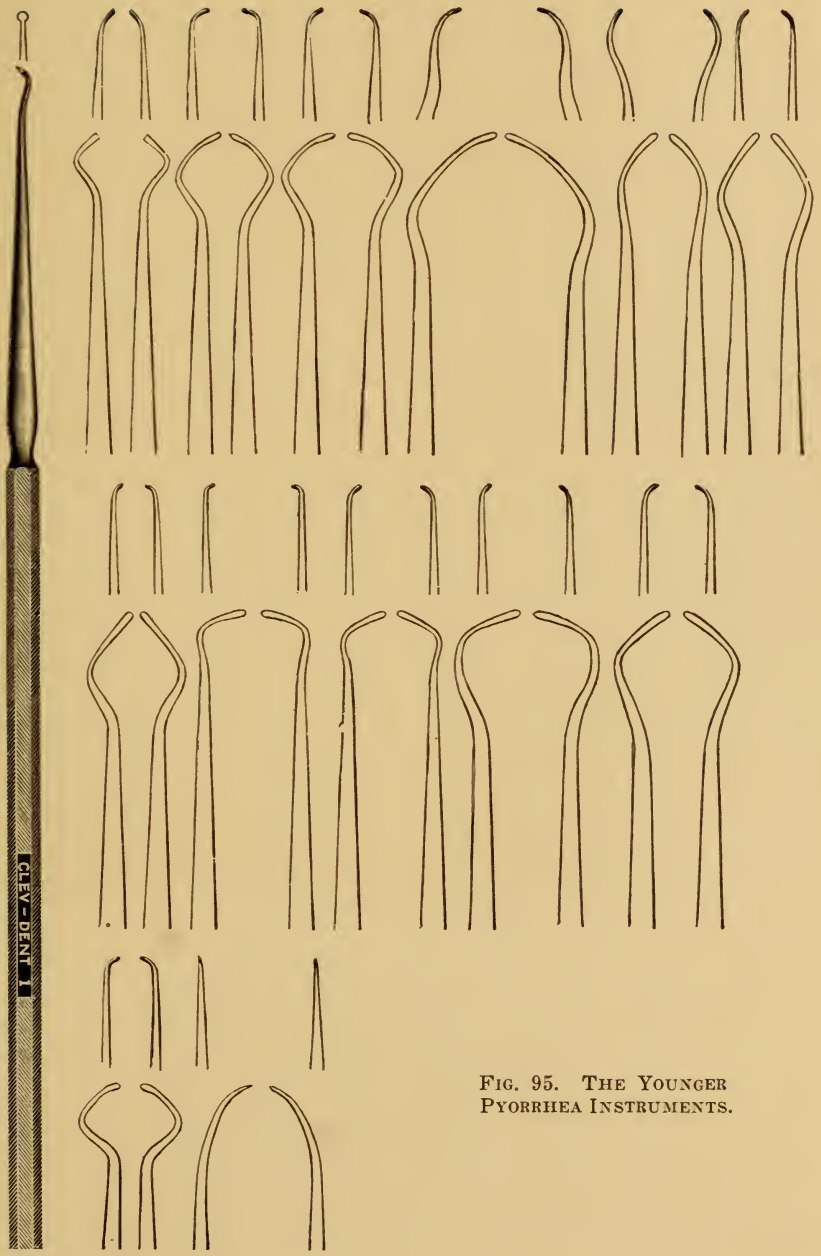


FIG. 95. THE YOUNGER PYORRHEA INSTRUMENTS.

with a fellow practitioner resulted in an invitation to visit his office and see some of his cases. I was shown some unquestionably successful results, work that any man might be proud of having done. The instruments used in this work consisted of a number of long-shanked delicately constructed files, and a variety of scraping instruments, all of which were unspeakably dull. Yet, had they been sharp, as the maker intended them to be, the tooth would have been too deeply cut and injured rather than improved, since a long, flexible shank requires pressure in using.

"When asked for an opinion I was forced to say: 'Doctor, you have obtained these good results through the imperfect condition of your instruments. Were I to use your instruments they are in just the condition I should wish them to be; their dullness has made it possible to leave smooth surfaces.' Sharp cutting instruments remove much of the cementum, leaving the tooth in a sensitive state, requiring a lapse of

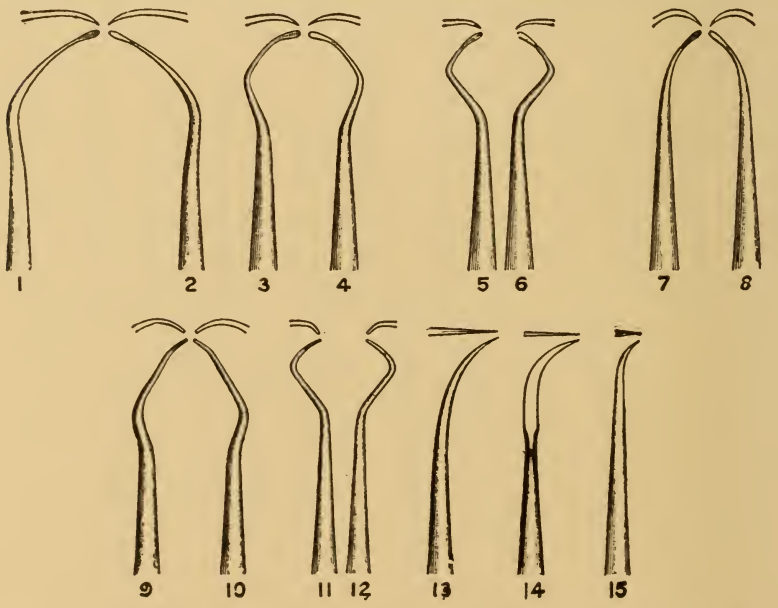


FIG. 96. THE GOOD REVISION OF THE YOUNGER PYORRHEA INSTRUMENT. CLEVE-DENT.

time to correct the injury. This effect rarely occurs where a planing instrument is skillfully used."

The W. J. Younger pyorrhea instruments receive a well-merited large sale. They have been condensed and modified by Dr. Robt. Good, into a new set, which is in the writer's opinion indispensable to any dentist who even "cleans teeth." Dr. Good says:

"These instruments are made thin, so they will pass under the gums easily, and I always use them with the 'pull' motion, never shoving, because the 'shove' motion will cause pain. The entire point is a cutting edge, so that it makes no difference at what angle the instrument is held, it will cut."

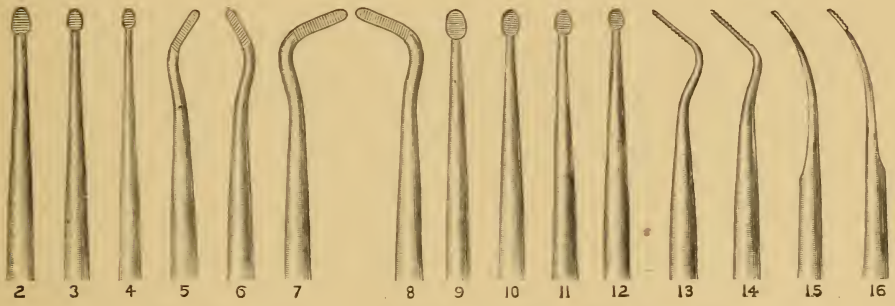


FIG. 97. SMITH'S PROPHYLAXIS INSTRUMENTS. IVORY.

The Smith prophylaxis instruments, and the various modifications by other dentists and manufacturers are used to remove deposits from the roots and necks of the teeth. The smaller oval forms are for opening into the diseased pockets. The large blades are for the interdental spaces. The writer has the blade of No. 13 of this set made three times longer and finds it most excellent to reach deep pockets on the posterior root surface of molars. The files are used to finish with after using other scalers.

Dr. Towner believes in the file type of instrument and gives his reasons in the following quotation: "The use of the file in the surgical treatment of pyorrhea alveolaris, and

kindred diseases, seems to be productive of more definite results than any instrument suggested. It is the most sensitive, accurate and delicate instrument yet devised. By its use one is enabled to develop a remarkable tactile sense, thereby being able to judge the condition of hidden surfaces, remove deposits, and polish surfaces treated with an unusual degree of accuracy. These instruments have an advantage which is seldom recognized in that the edges of the blades are serated, thereby permitting their use as positive working points in constricted bifurcated areas. They are delicate in that they clog and become dull sooner than other instruments, but the extra care necessary to keep them clean and sharp is more than compensated for in the favorable results attending their use."

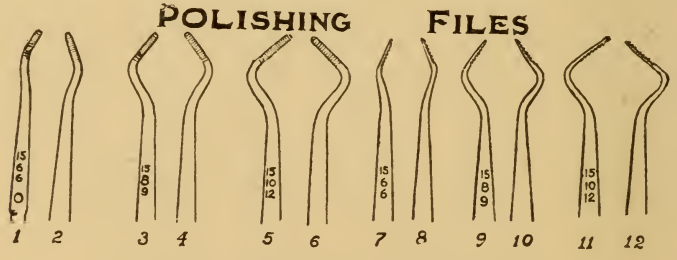


FIG. 98. DR. TOWNER'S INSTRUMENTS.

The M. H. Fletcher set of bone curettes and alveolitis burs, are fully described in another chapter by the inventor. These instruments are for cutting away dead and diseased bone about and beyond the roots of the teeth and are not styled nor intended for removing calcarious deposits.

The instruments above described are the ones most generally used. There are many others just as efficient for good work but nearly all of them are modifications of these standard types. As many of the points are made in pairs, or right and left, it is advisable, where possible, to buy these for cone socket handles. The writer prefers a double end,

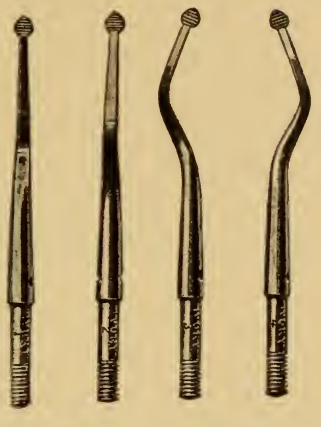


FIG. 99. TOMPKINS' PYORRHEA FILES.

octagon-shaped, hard rubber handle. This saves handling so many instruments. This handle can be boiled. The shape and size is just right to prevent cramping. Younger and Good use the various colored sealing wax knobs on their handles for this purpose, while Sarrazin has aluminum knobs with set screws, to use on small handles for the purpose of preventing slipping and cramping of the hand from long use.

CHAPTER XXVIII.

INSTRUMENTATION.

STERILIZATION OF INSTRUMENTS AND PREPARATION OF THE MOUTH FOR SURGICAL WORK.

If there is one thing about which the medical man has cause to laugh at the dentist, it is regarding the dentist's neglect of sterilizing instruments and cleaning the field of operation. The colleges are largely to blame because they do not lay sufficient stress on these subjects and do not require the dental students to practice the proper methods of sterilization in their college course.

The farcical nature of our processes probably does not depend so much on a lack of interest or desire to do the proper thing, as the lack of knowledge along these lines. In ordinary dental work, such as bridge work, crowns, and plates, it may not be of so much importance; but when it comes to such work as prophylaxis and pyorrhea, it is fully as important as in any other surgical work.

Not long ago it was noted that a professor of oral surgery in one of our colleges, in consultation, asked his assistant for a nerve broach, which was handed to him from the regular cabinet stock. He dipped it into alcohol for one second and then proceeded to use it, evidently under the impression that he was using a perfectly sterilized instrument. When a teacher makes such errors as this, is it to be wondered at that young dentists make mistakes?

The simple dipping of instruments into alcohol is not effective; the sterilizers that are generally furnished the dentists are also inefficient. They put up a good appearance, but further than this they are not worth much. Methods of

sterilization are of two kinds, antiseptic and heat. Alcohol in a jar shaped like a fruit jar with a screw top furnishes a convenient and effective receptacle. The instruments, both before and after the operation, must be thoroughly cleaned in running water with a clean brush, and then placed in the jar just mentioned and allowed to remain there for at least five minutes, when they can be taken out, and dried, or the alcohol burned off by bringing them in contact with a small flame.

Lysol and bichloride solutions are not to be recommended for this particular line of work, because if used strong enough to be effective, the mucous membrane of the mouth would be injured. Undoubtedly, the best form of sterilization yet found is heat. By heat, I do not mean the simple dipping of the instruments into hot water, but the whole instrument must be boiled for at least five minutes. In the summer time, to have a boiling receptacle in our office, is not the most pleasant companion. However, it will be found to be the best sterilizer; it also gives a good impression and is one of the best advertisements a dentist can have outside of good work. Undoubtedly, dental manufacturers realize this because all sterilizers have the word "sterilizer" written in large letters across the front of the apparatus.

Not only the dentist's instruments and material should be sterilized, but the dentist's hands should be rendered as

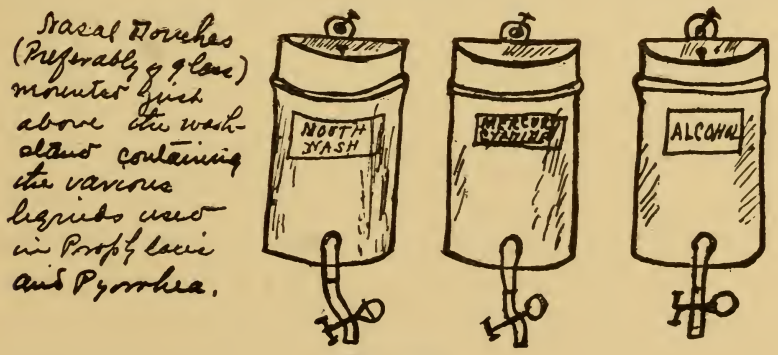


FIG. 100.

nearly aseptic as possible. After they have been thoroughly washed with a good grade of soap and a nail brush, a few drops of alcohol should be rubbed into them; this not only destroys the bacteria which may have been received from the previous patient, but makes the approach to the next patient more agreeable. The best way to manage this is by means of a shelf suspended above the wash bowl, on which is placed a fountain bottle as per illustration (No. 100). This is filled with grain alcohol, to which may be added some good toilet water.

CLEANSING THE FIELD OF OPERATION.

Peroxide of Hydrogen is a good agent to be used in mopping out the mouth. It can be applied by use of a cotton swab held by Skinner's "Kuoris." If it is not desirable to use peroxide, which is unpleasant to say the least of it, we can substitute a solution of aromatic spirits of ammonia, one part in five parts of water. This used as a spray or on a mop is very efficient for cutting loose the thick mucus covering the inside of the mouth, and at the same time, it is very cooling and pleasant for the patient. Next the gum surfaces and the infected area may be coated with Buckley's Pyorrhea Astringent, but preferably with Skinner's Disclosing Solution, previously described. The ordinary tincture of iodine is not so pleasant nor does it remain on as long as the Skinner's Disclosing Solution. If the mouth has been thoroughly mopped out, the antiseptic solution applied over all the surfaces, and the debris removed from open cavities which are filled, temporarily, with sandarac varnish and cotton, or with gutta-percha, we have done about all that is possible towards rendering the field of operation sterile.

A TECHNICAL DESCRIPTION OF THE SURGERY OF THE ROOT SURFACE, BY DR. THOMAS B. HARTZELL.

"In undertaking to write an article descriptive of the technical procedure, which must be observed in successfully

treating pyorrhea, I realize that I am undertaking a very difficult task. To portray in words or visualize technical procedure, is always difficult, but by the help of word pictures and illustrations together, I hope to be able to convey a comprehensive idea of the operation.

"The necessity for root surface surgery is now so thoroughly understood that we need not discuss that phase of the question at all, though it will be wise to discuss the histology of the root surface in order that we may have a reasonably clear idea of the necessity for the operation, and also that we may know how much of the root surface we should remove and where the cutting should stop.

"The root is suspended in its socket, as we all know, by fibres of sharpey; these fibres originate in the alveolar process. When the bone of the process is lost from any cause whatever, then these fibres hang dead upon the root surface and their decaying remains afford culture media in which micro-organisms may rapidly grow and accumulate. The root surface is, therefore, uneven and pitted with thousands of small depressions. These depressions were occupied by fibre ends, and offer to the eye, when observed under the microscope, a honey-comb like surface.

"The operation on the root surface may involve two things: First, the removal of any calculus deposited upon the root surface; and, second, the removal of the pitted root surface itself. Observing the structure of the root, from the pulp chamber outwardly, we note first that dental tubuli form the great bulk of the root. Just external to the tubuli, we may note a layer of typical bone which contains thousands upon thousands of lacunae connected by branching canaliculi. Approaching more nearly to the surface of the cementum, we see that the lacunae and canaliculi become fewer and fewer until the root surface is almost reached, at which point we note a narrow zone of bone which contains neither lacunae nor canaliculi. This dense layer is not

clearly defined as something that could be stripped up and peeled off, but, nevertheless, nature seems to have deposited this thin layer of hardened bony material as a foundation into which the Sharpey's fibres insert to form the suspensory ligament which is the sling or stirrup by which the tooth rides in its socket.

"The object of skinning the root surface is to rid that root surface of its bacterial holding power. Therefore, the amount of root surface which may be cut away with benefit to the tooth is that portion external to this dense layer which was created to support the fibre ends. And, because of the fact that this dense layer is very thin, one should guard carefully against cutting enough of it away to open the bone cells which are so plentifully distributed in the body of the cementum. Therefore, one should work with instruments so designed as to make it impossible in any single stroke to penetrate this hard layer.

"The instruments should be so designed as to offer the greatest amount of steadiness and accuracy of movement. To that end, it is desirable that the cutting bit, which is used to skin off the porous surface, should be flat and thick and sharpened to a right angle. It is also desirable that the instrument should rest on at least two points, rather than on the cutting edge alone. If the instrument's bit rests upon the cutting edge and that portion of the shank immediately contiguous to the cutting edge, we have the so-called two-point rest instrument, which certainly offers greater security and accuracy of movement than a razor-edged, one-pointed instrument possibly could afford. The following is an illustration of the instrument to be applied to root surfaces.

"On account of the unevenness of the root surface and on account of its convex and at times concave character, it is necessary to have instruments which can be readily adapted to convex surfaces as well as to concave flat surfaces, in order to accurately skin every bit of dead membrane pitted

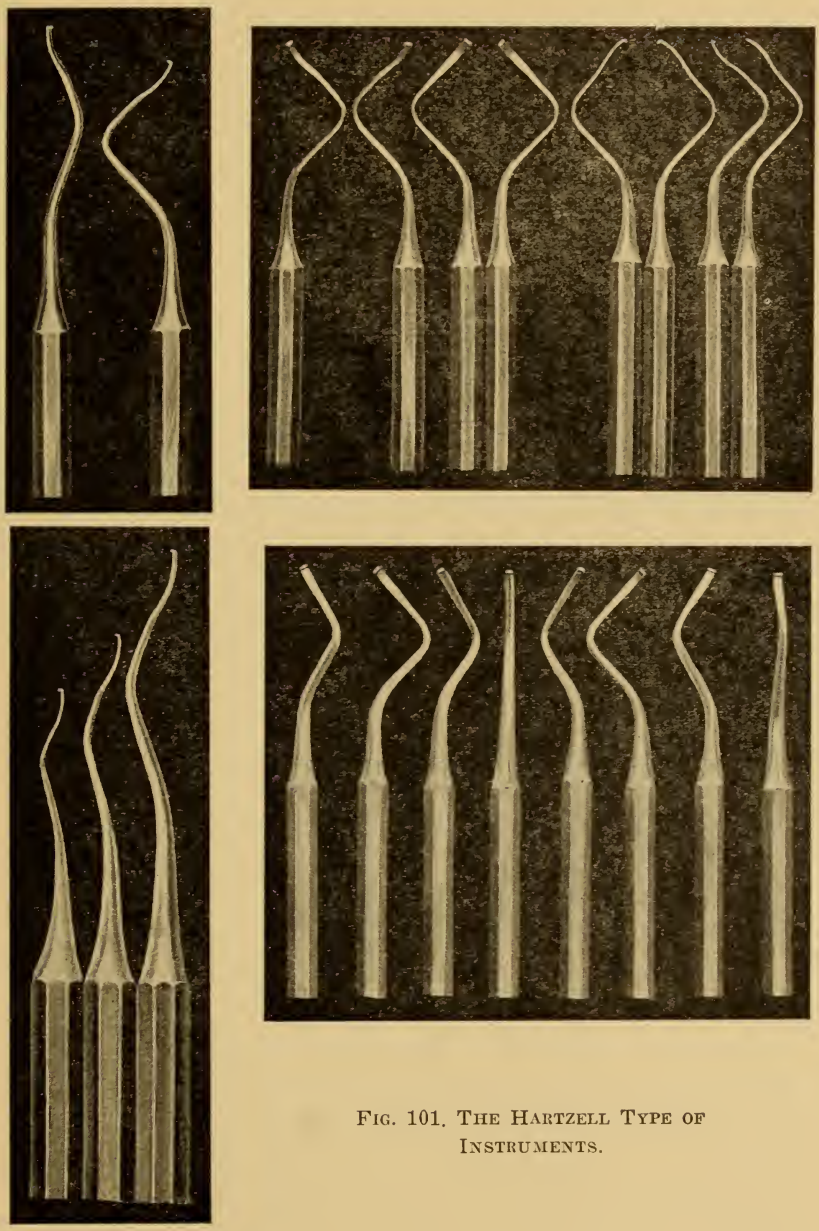


FIG. 101. THE HARTZELL TYPE OF INSTRUMENTS.

surface from any given root. This necessity at once creates the demand for three types of plane-heads. By the word "plane-head," I mean to describe the cutting bit and the portion of the shank immediately contiguous to it, which makes the two points of contact to the root, which must or should be in contact with the root surface as the instrument is moved. The plane-head, therefore, is to the tooth's root plane just what that portion of a carpenter's plane is, which is immediately in front of the cutting bit. It limits the depth to which the cutting bit must penetrate the tissue, and, as stated a moment ago, we need three types of plane-heads for ordinary tooth root surface surgery: concave plane-heads to fit convex root surfaces; convex plane-heads to fit concave root surfaces; and flat plane-heads to fit concave root surfaces; and flat plane-heads to fit flat root surfaces. This at once necessitates three types of plane-heads in any efficient set of instruments for root surface work. To that end, the author divides the instruments into three groups for these three types of surfaces.

"The next necessity, which the operator feels keenly, to fit the first right molar of any given patient, two and six designed to present a pair of blades which will fit the mesial buccal and distal lingual surfaces of the molar in question. Three and seven of this group of eight present a pair, which fits the buccal and lingual surfaces of a patient's right lower molar. Four and eight constitute a fourth pair designed to fit the distal buccal, and mesial lingual surfaces of a right lower molar.

"It does not necessarily follow that the operator need use every instrument of any given group of eight to plane a lower molar, but it is exceedingly helpful to have the instruments so planned as to make it possible to approach at least eight different aspects of any tooth in the mouth, without changing finger rest, if the operator so desires.

"A fifth essential is that in all of the instruments of whatever type, concave, convex, or flat, long, medium, or short, for operation far back in the mouth or almost straight or slight bend for operation in the anterior part of the mouth, or for what particular tooth or surface an instrument is intended, the cutting blade of the instrument should be directly in line with the center of the handle. This makes every instrument, no matter what bend the shank may have, in effect a straight instrument."

TREATMENT OF PYORRHEA ALVEOLARIS, BY DR. JOHN DEANS PATTERSON.

(From Johnson's "Operative Dentistry," by permission of P. Blakiston's Son & Co.)

"In beginning the operation of scaling, it is wise to select only that number of teeth for one operation which can be entirely finished at one sitting. If the disease is in the incipient stages, frequently a number of teeth can be treated; if the condition is in the advanced stages, from one to four should be the limit. In all cases each operation should be limited to an hour, for, in the first place, whatever the means used for obtunding, the operation is more or less painful; the teeth operated upon are also left in a condition acutely sensitive to thermal changes, and if many teeth are treated at one sitting, the discomfort is distressing for many days on this account; so it is surely best to confine this discomfort and the painful scaling to a limited time and a limited area to prevent accumulated discomfort in cervical territory on account of thermal irritation, and to prevent shock from the unavoidable pain of the operation. With the correct diagnosis as to the extent of the disease and the selection of the suitable instruments, there must be a determination upon the part of the operator that the roots selected to be operated upon at any sitting shall be entirely freed from irritating deposits and the surfaces left in a condition to encourage

the new tissue of repair to form. The surgical part is not complete upon the removal of deposits, but after that these surfaces should be smoothed and polished as perfectly as may be. About the crowns and the cervix of the tooth engine instruments with brushes, strips, rubber cones, etc., of a great variety of shapes, are applicable; beyond the gum margin hand instruments must be used. The various wood and other points, held in suitable porte-polisher and charged with an abrasive, must reach all possible surfaces. Experience has taught that the time spent in smoothing the roots is well worth the endeavor, for the rapidity and permanency of recovery is greatly enhanced, and the operation can not be considered completed until as much time is given to the polishing as to the removal of deposits.

"The polishing concluded, then comes the removal of all loosened detritus with the hot water used in a strong force syringe with slender special points which will reach well down into the pockets; these points are best made of silver or German silver, and can be fashioned by any instrument maker.

"If the operation has been well done, it is inadvisable to disturb the pockets, which are soon filled with the plasma, out of which repair comes. The very common practice of frequent probing and medicating is *strongly condemned.*"

THE SARRAZIN TREATMENT.

Dr. J. J. Sarrazin has worked out an elaborate system of prophylaxis and pyorrhea treatment. The *Dental Cosmos* (May, 1910) gives his system of treating pyorrheal conditions. From this article I quote:

"There are two ways of handling a jaw which is affected generally by the disease. One is to begin at the most posterior tooth on one side and stop at the median line; then continue by starting at the most posterior tooth on the opposite side and again come to the median line. This has

the advantage of allowing time for molars on one side of the mouth to lose much of their tenderness before the molars on the opposite sides are made too sore for mastication. The second way will grow out of aggravated conditions in some localities, in which instances the operator will see that such places must be operated upon at the start, so that ample time may elapse to watch their behavior while the surgical treatment is being continued elsewhere.

"I am partial to pull-cut instruments for accomplishing just exactly what is wanted on roots. On a smaller scale, the motion of such instruments should be more like that of a vulcanite scraper on a plate, and still more similar to that of a pencil eraser on paper, the push stroke being much lighter, and not like that of a plane on wood. Instrument points should be so directed as to operate on only a small speck of a root surface at a time, making sure of having completely scaled that point before passing to an adjacent spot either horizontally or vertically. Such operating should be done not only where well-defined pockets exist, but also wherever soft tissues fail to closely hug and adhere to cementum. If the alveolar tissue be affected beyond diseased portions surely lead to it, if they are properly followed. On the other hand, soft tissue should be respected wherever it is attached to the pericementum, but instruments should reach quite to the lines of such attachments in every direction.

"If operations have been severe, wounds should be frequently irrigated, just as is practiced in general surgery, until such a time as the tissue shows a proper tendency to heal. Bismuth paste following such irrigation acts very favorably, at the same time warding off the danger of impaction of fermentative material.

"However thorough the scaling of a single or multi-rooted tooth may have been, there is safety in making use immediately after operating, of a drug capable of dissolv-

ing calcareous particles. Wherever the alveolus has been seriously affected, greater reliance may probably be placed on 50 per cent. sulfuric acid in glycerin, because long clinical experience indicates its marked action on hard tissues, with a reduced irritation to soft ones."

FLETCHER'S METHOD OF REMOVING DISEASED ALVEOLUS.

The following quotation is taken from "Alveolitis—the Disease of Which Pyorrhea Alveolaris is One Stage," by Dr. M. H. Fletcher, printed in the *Dental Summary*:

"To operate in any of these cases is surgery and not dentistry, so that the stomatologist also needs to be skillful in operative surgery to a degree which gives him suitable knowledge and confidence in himself to handle a patient undergoing the removal of part of the alveolar process either above or below. Further, the operator should be so in touch with this patient and the extent of the operation as to know whether the operation should be performed under local or general anesthesia, and whether it should all be done at once or at intervals of a few days or weeks for general and systemic complications from secondary and acute infection may occur at any time.

"The curettes or hand instruments are all of the hoe and hatchet type, varying only in size of blade and length and shape of shank. The attempt is made by these variations to reach any extended tract of necrosis. The necrosed portions are usually friable—that is, in the state of osteoporosis—and can easily be cut away with the curettes; but certain phases of the disease and certain kinds of infection often result in osteosclerosis; that is, hardened or eburnated bone, on which the curettes make little headway. For cutting these hardened bones I have made some extra long bone-cutting burs, both for the straight and right angle hand-pieces. The contra-angle seems to be more suited to the

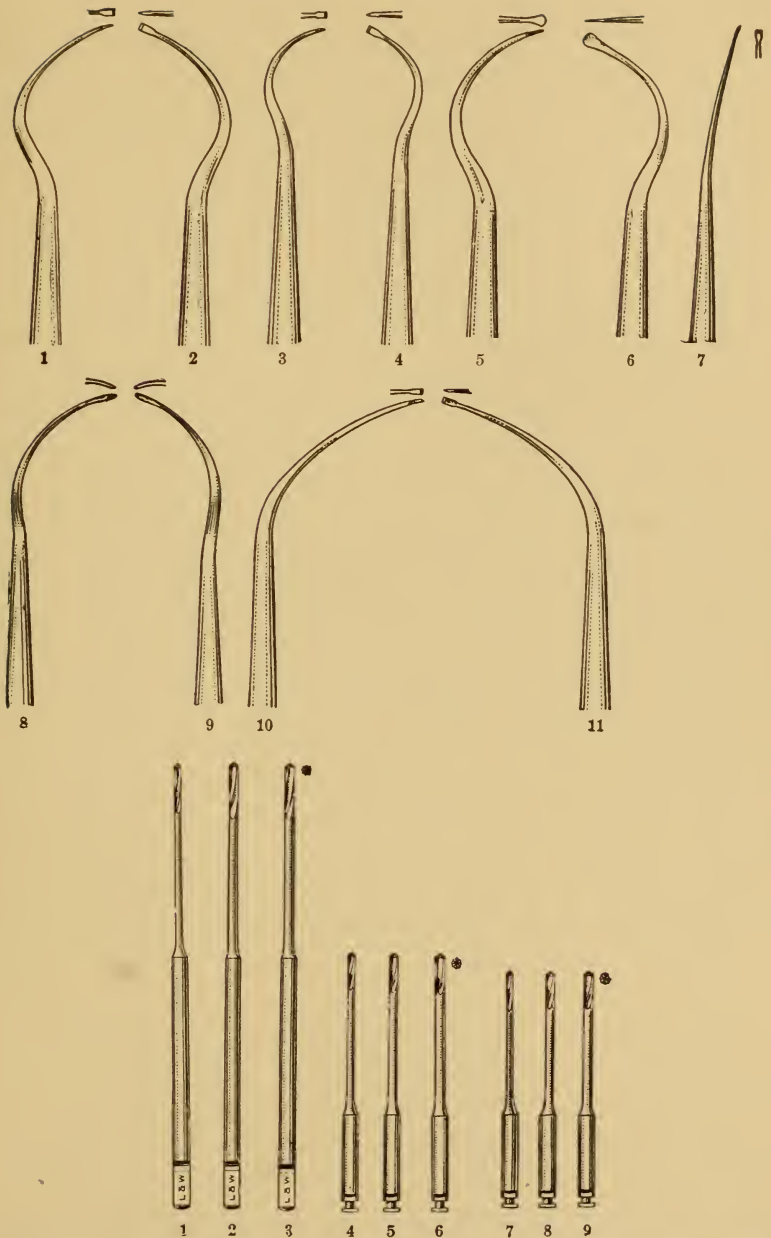


FIG. 102. FLETCHER'S SET OF BONE CURETTES AND ALVEOLAR BURS FOR CUTTING AWAY DEAD AND DISEASED BONE. NOT INTENDED FOR REMOVING DEPOSITS.

work, however, than the right angle. The burs for the contra-angle will reach all cases in the lower jaw and most of the upper, but a bur two and one-half to three inches long—that is, one long enough to reach to and into the antrum—is often necessary for the upper jaw.

"The laws of regeneration do not permit of complete healing of bone tissue inside of several weeks at the shortest, and often require several months, so that patience and careful watching are necessary on the part of both patient and doctor. One patient now on my list for nearly a year, who would not submit to a radical removal of cancellous bone in the superior maxillary, has submitted to a small amount of removal from time to time, and is gradually recovering under two dressing treatments a week. This case, however, was the result of a dental abscess arising at the apex of a superior lateral which had discharged into floor of the nose.

"After curetting and burring have been done, the cavities should be washed out with a warm antiseptic solution to remove the cuttings. The blood should be allowed to clot in the cavity. My plan is to be careful not to disturb the blood clot as long as it remains aseptic. If there is a tendency for pus to form, the wound should be washed out every one, two, or three days, according to conditions, and, if pus continues after ten days, a second, third, or even more attempts must be made to remove the offending material.

"Aseptic blood clot is Nature's 'false work' or scaffolding on and into which she builds all new tissues, no matter of what kind. The less the healthy clot is disturbed, the more prompt is the repair. In the blood clot is formed the granulation tissue of repair, which is the second stage of the building of new tissues. Any disturbance to these granules is also a hindrance to repair; hence packing is seldom called for.

"If I have suggested anything new or valuable, I believe it is the necessity of either curetting or burring about all teeth where the disease is found, and of more thorough removal, if the disease is deep seated."

DR. L. C. LEROY'S TREATMENT.

"There are but two very vital phases in the treatment of pyorrhea that I ask the privilege of considering: the surgical care of the teeth, instrumentation, and the protection against re-infection, particularly where much of the alveolus has been destroyed, leaving large interdental spaces.

"Instrumentation is the "crux" of the entire procedure. It must be thorough, the root surfaces must not be impaired, and the soft tissues should not be mutilated; in fact, they should be left practically uninjured.

"To fulfill all of the above requires the use of instruments peculiarly strong and delicate, for it must be remembered that the deposits on teeth roots extend *apically* below the still existing alveolar border as well as coronally. Instrumentation *there* is the "crux." To be able to place the instrument on or beyond the adhesions at this situation is the most important part of the operation. It is within the ability of most all operators, with the average scaling instruments, to remove calculus from the deepest pockets—*all but that which is in direct contact with the still existing peridental membrane,* which is really the exciting cause of the disease.

"It is the practice and the teaching of some operators literally to plane the root surfaces by using instruments, the points of which are at right angles with the shanks—scrapers—which removes part of the cementum. I will not say more against such procedure than that, in removing the outer smooth cemental lamella, dental caries is the frequent sequel, particularly interdentally subgingivally, where it is almost impossible to maintain prophylaxis.

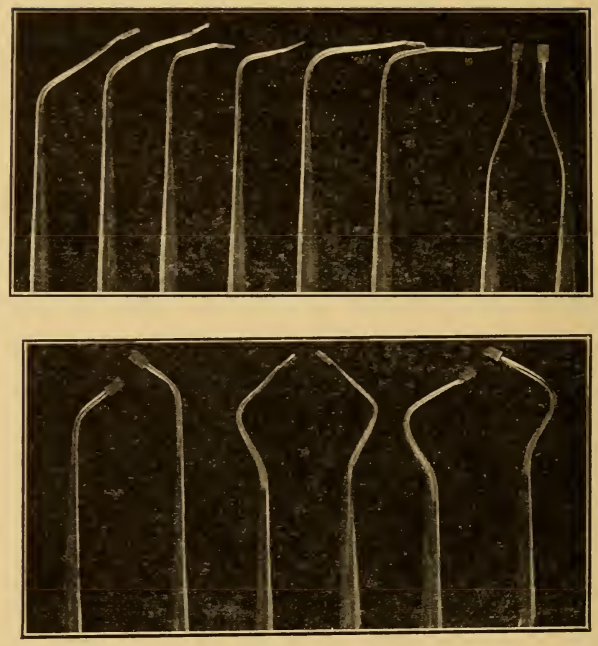


FIG. 103. THE LEROY TYPE OF INSTRUMENT GIVES THE OPERATOR A VERY DELICATE WORKING POINT FOR PROPHYLAXIS AND PYORRHEA WORK.

"The instrument devised by me is a plane in character. The relationship of the working point to the surface to be operated on is controlled by the "rest" or wrist (see markings on cut), which is very effective in removing adhesions by the push stroke, but it must be used with care. The surface of the blade just behind the point is serrated, being designed to crush calcular adhesions on the pull stroke, which is used almost exclusively in the deeper parts. Having located the deposits with the tip of the instrument, the procedure is to lift the point until it rests on them, put pressure on the shank, and pull back with the same movement, thus breaking down the adhesions by a crushing process.

"The working point is bent at such an angle as to just lift the serrated surface from the tooth when the push stroke is used; but when pressure is applied against the root on the

pull stroke, the serrations lie flat against and engage the deposits, and the crushing of them is accomplished.

"Complicated bends or angles or corkscrew effects have purposely been avoided and are generally unnecessary, as the deposits on teeth most invariably occur in line with the long axis of the tooth and only deflect when the bifurcation of the roots or the apex of the root becomes involved.

"This instrument has extreme delicacy and strength without being springy. The sides of the blade are levelled—as is also the point—which makes dentate scalers of movements in lateral directions. It is an instrument that can be introduced easily into the deepest pyorrhetic pockets without mutilating the tissues. The shanks are so shaped as to follow the contour of the roots, thus interfering least with the working point and one's tactile sense.

"It is very essential to keep all instruments, and particularly these, in perfect condition as to sharpness. Drawing it across an Arkansas stone may at times seem not to accomplish the sharpening of this instrument. Upon examination with a magnifying glass, it will be found that one of the serrations has worn away. It is necessary to grind with a very fine stone until the apex of the next serration is reached, when the full efficiency of the instrument will be restored.

"The other very vital phase in the treatment of pyorrhea is the maintenance of a degree of cleanliness of the teeth. This is practically impossible in many cases, especially where the interdental septum of alveolus has been destroyed, leaving recesses between the teeth or bifurcations of the roots, which can not be protected from recurrent plaque formations freighted with micro-organisms or from food particles which must decompose and contribute an irritating factor. The physical resistance of some patients treated for pyorrhea is so high and their facility at oral hygiene so proficient that very little effort suffices to maintain a healthy condition, but there are many others who try our patience and resource-

fulness thoroughly. No doubt, everyone laboring in this field has felt disheartened at times to find that inflammation would persist in some cases in spite of all approved practices and that, although the pyorrhea—pus symptoms—had been cured, there would be periods of acute inflammation at given sites, increasing mobility of a tooth or teeth and finally resulting in the loss of same.

"To me, the persistency of gingival irritations due to mucoid adhesions, not necessarily in deep pockets but in irregular areas or under the shelves of tipped teeth, etc., stimulated my investigations. The metallic salts (silver, zinc, copper, etc.) in solutions were tried, but their effects were very temporary. The bifurcations of roots were filled with gutta percha amalgam or the oxy-phosphate cements, but they all had their disadvantages. The problem for bifurcations was solved when Dr. Ames' copper phosphate cement was given to us. It was quite a while after using it for bifurcations before I had the courage to use it interdentally, especially where the pockets were deep; but now it is part of my treatment of any given case to use copper phosphate, the "original" preferably, to fill the interdental spaces completely, overlaying it wherever it shows when the teeth are exposed with a hydraulic-phosphate pigmented to make it less conspicuous. Many teeth become susceptible to thermal shock after the roots have been operated on or are hypersensitive to brushing. Cover with copper phosphate.

"My procedure is first to allow some days to elapse after operating to permit such granulations to occur as will and, too, to determine the recession of pyogenic conditions. Then, after determining to which tooth-wall, the mesial or the distal, to make the cement adhere, the tooth is protected with cotton rolls; the space freed from moisture by absorbents, not dessicated; the cement is mixed with plastic, carried to place and then forced to the deepest recesses with a piece of spunk; more copper phosphate is applied; the spunk used

again until the cement protrudes on the opposite side of the space, then it is shaped about the tooth, covered with a piece of tin foil for a few minutes until hardening has taken place. The tin foil is removed, the edges trimmed (be particularly careful not to allow jagged edges to irritate the gums or cheeks), and the operation is complete.

"Of course, the color is against copper phosphate, but nothing else that we have at the present time will do what it does. It is positively germicidal and antiseptic. Some find it difficult and messy to use, but the results obtained far outbalance the disadvantages. It sticks to anything and everything, and almost everlastingly. Once in awhile it will break away, but—replace it.

"I have used it in this way probably ten years and would not keep house without it. This is the first time that I have published these findings, but I am so sure of the great efficiency of sealing interdental spaces completely that I am glad of the opportunity of contributing to your interesting book something that has revolutionized pyorrhetic practice for me and given me a greater latitude of success."

CHAPTER XXIX.

TREATMENT.

TREATMENT.—DRUGS COMMONLY USED.—APPLICATIONS USED BY YOUNGER, MEISBURGER AND HEAD.

If there is one general criticism that can be made against the dental profession it is in regard to the general method of dealing with patients presenting themselves with cases of pyorrhea. It has been the experience of all of us who have treated a considerable number of such cases to see patients with merely a condition of slight irritation of the gum margins who had been informed by some dentists that their case was incurable. We find that dentists, as a general rule, do not like to treat these cases, preferring to throw them off with the simple statement that the case is incurable. This certainly lessens the respect of the patients for the dental profession, but of much greater importance is the fact that it means the loss of many teeth which should be saved; the patient, believing absolutely in the integrity of the denitst, has gone on and on without seeking other aid.

If a splinter should stick in the finger the tissue soon turns red and suppuration takes place. Now, exactly the same thing takes place in the mouth. If a dentist should stick a splinter in his hand, he probably would not inject any of the strong pyorrhea remedies. Rather he would remove the cause. The same thing is true in pyorrhea. The pathology of the tissue surrounding the splinter is the same as that which makes the red tinge on the gums and the final suppuration. The pathological picture is simple and plain; Dr. Tolbot goes so far as to say that the dentist, allowing a patient affected with disease to go out of his office without

telling him of his condition, is guilty of mal-practice. Incipient pyorrhea is easily cured. Just as removing the splinter cures the finger, so incipient pyorrhea will get well in a few days if the teeth are cleansed and the tartar removed from under the gum margin.

Every dentist should know the facts now so well established regarding the beginning of this disease; no matter what the condition, a great deal can be accomplished by treatment that is simple and easy, giving the patient great relief and saving teeth for future service.

Of course, it must be realized that hard work will often not be paid for at the fees we are accustomed to receive for other work; but if we do our duty towards this end, we will soon become more expert and in time our success will enable us to receive reasonable compensation.

Dr. D. D. Smith says: "Pyorrhea alveolaris is by no means a subject to be treated in a hit or miss haphazard manner; it is a foe worthy of the steel of a valiant aggressor and consequently requires careful consideration, a steady hand, a keen sense of touch, and sound judgment."

Dr. Louis Meisburger writes: "I would like to say that the thing uppermost in my mind at present and which, unless persisted in by the author and teacher will ultimately bring into disrepute the honest efforts of those who are giving their best endeavores in the treatment of pyorrhea, is that dentists are not, as a rule, willing to devote as much time to acquire the skill necessary to obtain results in pyorrhea as they do to any other branch of our work. Until this is done, they can not appreciate that surgical interference, above all else, is of paramount importance in accomplishing results. To this end they must acquire not only the delicacy of manipulation in instrumentation, but also must familiarize themselves with the anatomy and dental histology in the field of operation to do the work intelligently."

Dr. M. M. Bettman says: "The main point in the treatment of pyorrhea is the thorough scaling and polishing of the roots and the correction of any malocclusion which may exist, no matter how slight."

Dr. R. G. Hutchinson, Jr., says: "The time will never come when every dentist can successfully treat pyorrhea. It is unreasonable to expect that what requires special training can be accomplished by one who only occasionally engages in such practice. It is also unreasonable to believe that because the operation can not be accomplished by the majority it is impossible."

The Younger method, as carried out by Good and others of this school, consists of first thoroughly removing all concretions and carious bone, then injecting pure warm lactic acid into these cleansed pockets, with care that it does not run over the external gum margin. This is effected by the use of a small caliber, round pointed steel needle on a hypodermic syringe. The particular one used by Good, can be procured from Sharp & Smith, of Chicago. This treatment is repeated three or four times at intervals of several days and only a few teeth are treated at a sitting. The object of this treatment, as claimed by these operators is, that the acid produces somewhat of a solvent effect upon whatever concretions have remained and also upon the carious bone. In addition to this, it has a somewhat stimulating effect on the granulation tissue which surrounds the tooth roots and a new attachment is formed. While it is undoubtedly true that this treatment has produced good results it is just as true that their method can not be said to be without objection. I believe the success they obtain can be attributed more to the thorough cleansing of the pocket than to the injection of this acid.

I am led to believe that the same result could be obtained by the injection of almost any other strong drug such, for instance, as Tartar Solvent, which, it is said, does not have

the disadvantage of dissolving the tooth root. If you will place a tooth root in pure lactic acid and allow it to remain for twenty-four hours, it becomes changed into a jelly-like mass. This is prevented in the mouth by the fact that the injection remains only a minute before it is washed out by the surrounding liquids, but there is the possibility that some of it may be retained in a remote cavity.

One of the most perplexing cases that I have had to diagnose was that of an army officer who had been treated by the lactic acid method. He had received great benefit from the treatment, but from time to time he suffered excruciating pain on the side which had been treated. Several examinations, at intervals, were made in an endeavor to diagnose the cause of this trouble, but without success until an X-ray was made that showed a cavity in the upper cuspid root about the middle third. The instrument was inserted through the old pocket opening and, when high enough, fell into this cavity. The patient almost leaped out of the chair with pain. There was nothing that could be done except to extract the tooth. It was found that the constant application of this acid had dissolved the tooth with the final result of exposure of the pulp. There was no sign of decay except such as acid produces on tooth substance. While this is probably a rare termination of the treatment, at the same time, it is well to call attention to the possibility of this complication occuring in deep pockets. Another objection to the filling of these pockets with this or any other strong drug, is the great amount of pain which sometimes accompanies such treatment. It is well, if possible, to secure some degree of anesthesia of these sensitive teeth before subjecting them to the pain of this treatment.

Another drug used by many is trichloracetic acid. After thorough instrumentation, sections of the gum are dried with cotton rolls or napkins and the pockets are saturated with a ten per cent. solution of trichloracetic acid, using small

ropes of cotton, or wood tooth picks. This treatment is repeated in three or four days but should not be used more than three applications.

After the operation of curetting out these pockets, if suppuration continues, Dr. Kelsey recommends the use of phenol-sulphonic acid to be applied with a small pointed wood applicator.

Deliquessed chloride of zinc, very slightly diluted, and applied on small wood applicators into pockets, has some advocates.

Fielder, of the Royal University of Breslau, modifies the Younger treatment as follows: "After scraping away deposits, the teeth, including their necks, are polished and when they have been dried we introduce iodine or lactic acid with iodine tincture because the former is borne badly on account of its nasty taste, and also because in some cases it produces severe pain. I introduce both drugs into the pockets on Japanese bibulous paper wound around nerve needle. Often from two to four medical after-treatments suffice, carried out once or twice a week."

The result obtained by the use of these drugs is the cicatrization of the tissue.

Dr. Louis Meisburger reports excellent results from the use of a two or three per cent. solution of iodine to flush the pockets after operation. The making of this solution he expresses in a rather characteristic manner: "This can be approximated by getting the color of light beer. In this connection I might say that to those not familiar with beer, the ginger-ale color answers as well."

Several years ago, Dr. Joseph Head, of Philadelphia, gave a most sensational report, claiming that bifluoride of ammonia has a most peculiar action of dissolving tartar from the teeth without harming the tooth structure. As teeth and tartar are the same chemically, this seemed most remarkable. This preparation has a place in the treatment

of pyorrhea and we quote at length from his own description of this method. One precaution that must be observed is to secure a suitable syringe, preferably the celluloid syringe. This holds a small quantity and will deliver drop by drop. Dr. Head thus describes his method:

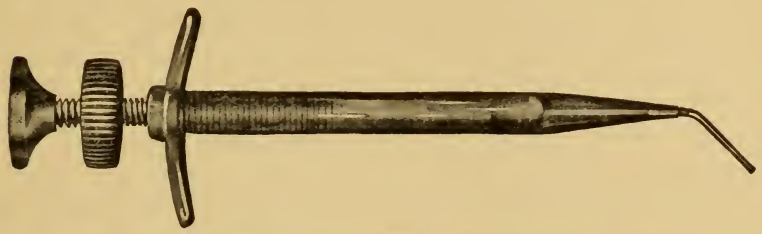


FIG. 104. CELLULOID SYRINGE WITH PLATINUM POINT.

No flooding of the mouth. One or two drops at the bottom of the pocket.

"Through an extensive series of experiments it was proven that a twenty to twenty-three per cent. solution of bifluoride of ammonia (an acid salt of hydrofluoric acid) will disintegrate the tartar on a tooth as readily as hydrofluoric acid itself and also leave the tooth apparently unsoftened. Later experiments have shown that this solution can also be applied to the gums with the most beneficial effects, as it seemingly stimulates the tissues and diseased bone to such healthy action that deep pockets around loose teeth speedily fill up with healthy firm tissue and the sensitive teeth are reunited to the gums, becoming secure and useful agents in the process of mastication. After one or two injections, the soreness will largely disappear and all the tartar scale that could not be so easily and painlessly removed at the first two sittings tends to be so loosened that its thorough removal by the scalers is easy for both patient and dentist. After four or five applications, one week apart, black scales that have escaped the scaler will sometimes be found floating loose in the pocket so that they can be readily picked out and the root will be as smooth as velvet to the touch of the instrument.

"In closing, perhaps, it would be well to tersely run over the steps of my treatment of pyorrhea. Take off all tartar that can easily be removed and cleanse the mouth as thoroughly as can be painlessly accomplished, at the same time instructing the patient in the use of brush, floss silk and mouth wash, pointing out particularly where he fails to reach the bacterial plaques, and demonstrating what motions of the brush are necessary to remove the plaques. The syringe should then be filled with bifluoride of ammonia and the platinum point inserted near to the bottom of the pocket or pockets, which should be filled full from the bottom to the top. During the operation of injecting the pockets, the cheek and tongue may be guarded with napkins with which all excess or overflow should be wiped away. Then the patient should be allowed to spit for a minute or two when the mouth may be slightly rinsed with water to remove any excess of acid. Less irritation to the mucous membrane occurs from this method than that formerly advocated, which consisted in allowing the solution to rest in the pocket for a minute or two minutes. The patient is then dismissed with the instruction to return in a week. He is also cautioned to carefully observe all directions on home prophylaxis. When he returns next week the teeth are again scaled as far as feasible, cleaning them thoroughly with brush and pumice and a coating of tincture of iodine. When this is finished another application of the bifluoride is made as before. The procedure for the third sitting is as for the second, but usually after that the teeth are free from tartar, the pockets have started to heal and the treatments need be for a period of only about fifteen minutes, just long enough for the application of the bifluoride and the little cleaning and scaling required. The bifluoride should not be applied oftener than twice a week and usually once a week is more desirable. Of course loose teeth should be tied to their secure neighbors whenever feasible."

CHAPTER XXX.

TREATMENT—CONTINUED.

TREATMENT OF MERRITT, DUNLOP, LUNDY, WEST AND REID.

TREATMENT OF MERRITT.

Report of an Interesting Case of Pyorrhea and the Treatment Employed. By Dr. A. H. Merritt, New York.

(Dr. Merritt, at my request, wrote me this description of a pyorrhea case in a patient 18 years of age, stating that it is the youngest patient in all his experience with so advanced a case. The radiographs of this case were made by Dr. George M. MacKee. (Fig. 105.)

"This case I am seeing for the last time on June 21st. The gums have already resumed normal color, the discharge of pus which was enormous has entirely ceased, the teeth are markedly more firm and except for slight sensitiveness to thermal shock perfectly comfortable, though the patient was in constant pain all about the gums, with a calcic abscess on gums over one molar when treatment was commenced in April. Treatment to date has been entirely local, except the administration of calomel and sodium phosphate for constipation. The local treatment consisted of a very thorough scaling of the root of each tooth with scalers made from my own design, finishing in some instances with fine files, with these latter the edge of the alveolar plates, and where necessary smoothing off ragged edges. This was followed each time by the application of weak solution of tincture of iodine (35 to 50%) with careful prophylactic treatments.

"All weakened teeth were ground off so as to relieve them from undue stress. The patient was carefully instructed

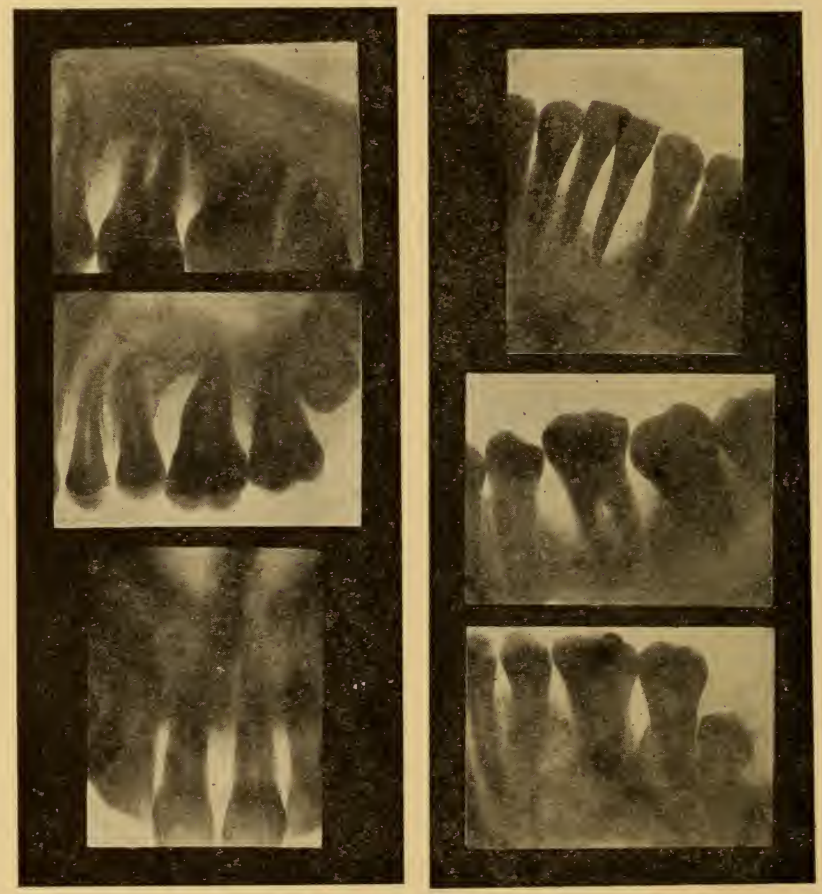


FIG. 105. RADIOGRAPHS OF DR. MERRITT'S CASE.

in the home care of her teeth, proper brush provided and instructions given in its use (two minutes each time, four times daily, straight up and down over all the gums). This briefly outlines the treatment I follow in all such cases with most gratifying results. This particular case was exhibited at a public clinic before treatment was begun and will again be shown next autumn to the same men to confirm my experience in such cases.

"To me it seems that there is too much theory in the treatment of all pyorrhea cases, making it appear to be very difficult, when in reality it is comparatively simple."

TREATMENT OF PYORRHEA WITH ETHYL BORATE GAS, BY DR. WM. F. DUNLOP.

"The Dunlop Treatment consists primarily in the introduction of oxygen into the tissues and circulation, and stimulating nerve control. It had long been recognized that oxygen could probably cure pyorrhea, and many experiments have been made with a view to forcing the gas directly into the gums. These attempts failed because pure oxygen unfortunately burns up live tissue as well as dead tissue.

"I use the ethyl borate gas under pressure, which is introduced by means of a small needle at the free margin of the affected gums. The features of this gas as against pure oxygen are: first, that it destroys only dead matter, by stimulating the circulation. The live tissues are not attacked by the gas at all. Secondly, the gas travels through the pus passage and ramifications about the roots and along the jaw, not by pressure, but by its own natural affinity for pus and dead matter.

"When a case of pyorrhea has been cured and the passages have been emptied of microbes and putrifying secretions, the gums refuse to take the gas.

"I believe that this gas cures by virtue of its burning up dead matter and its stimulation of blood circulation. Recent experiments suggests that gas gets results as a germicide by increased circulation.

"Before applying the gas it is first necessary to remove the original cause of the disease, viz.: the local irritation.

"After the operation is completed we are ready for the vapor treatment; the gums are sprayed and all the pockets fully impregnated with the antiseptic from the machine. Before the patient is discharged, place a strip of the pocket

packer over the free margins of the gums, pressed firmly in between the teeth, both lingual and buccal. This must remain in place in order to keep the tender surfaces of the gum free from contact with the secretions of the mouth and any other foreign substance. The deeper pockets are to have a small portion of the pocket packer forced up into them, and a warm instrument passed into it while in position. This will hermetically seal the space or pocket.

"When the patient presents himself for the second sitting, the pocket packer is removed, the gums thoroughly sprayed with the machine, the same being properly charged to throw this spray without the use of the needle. You next put the needle on the tube. Opening the valve on the machine it will be found that a dry gas or vapor escapes from the needle. In passing the needle around the gingival margin, or perhaps slightly under it in some cases, it will be seen that the gas is taken up by the inflamed ducts, and it will pass up through the gums, forming little stringers, and will only stop when they seem to reach their destination in the glands themselves. This action is visible to the naked eye.

"Generally, where this inflammation is pronounced, there will be a cyanotic condition of the gums, caused by improper elimination, or a lack of oxygen. This gas being carried into the tissues is robbed of its oxygen, and the solids are precipitated into the tissues, causing an inflammation, which brings blood to the parts, the same as any other irritation will cause an influx of blood, but with the difference that in this case the tissues are thoroughly oxygenated and circulation is re-established, the cyanotic condition disappearing. The tissues producing cells are stimulated to action, and constantly fed by the application of this gas until they will receive no more. If this is kept up at intervals—with a few days apart—and the surfaces kept clean, we have not only the rebuilding of this lost material, but there is a re-attach-

ment of the root of the tooth to the alveolar dental membrane and a consequent cure."

The above article on the Dunlop method is given for the reason that it is entirely a new departure in our methods of treating pyorrhea. The author has endeavored to secure more data as to its relative efficiency, but it has not been on the market long enough to gather any definite information.

There are many who claim that deep infection in the alveolar process can be relieved by its use. However, there is some opposition developed against it as voiced by the following quotation from Talbot, in his "Interstitial Gingivitis and Pyorrhea Alveolaris."

"Within the past year a machine has been placed upon the market for the supposed purpose of forcing oxygen through the tissues in the treatment of this disease. I have watched this process of treatment 'with fear and trembling' since the method of application forces the pus germs through the inflamed alveolar process. Why infection does not occur is a mystery. This method of applying drugs and forcing pus germs into the tissues without infection is a strong point in favor of the non-infectious theory of interstitial gingivitis."

TREATMENT OF DR. E. A. LUNDY.

"The majority of cases presenting are simply an oral manifestation of a systemic disturbance. For twelve years past my treatment has been both from a local and systemic standpoint, and results obtained have been far more satisfactory.

"My systemic treatment varies in individual cases, but is arranged with a view to the establishment of a normal elimination and assimilation. I find in the majority of cases that constipation is present with resultant auto-intoxication, and my treatment is with a view to overcoming such conditions. My first efforts may be by internal medication, but later I resort to that of a proper dietary, in which I try and pre-

scribe such foods as are compatible and require chewing. I also try and prescribe a non-uric acid dietary.

"My favorite remedies for local treatment at present are Dr. Sens solution of iodin and potassium iodide, one part to water four hundred parts, making practically a one per cent. solution."

TREATMENT OF DR. J. B. WEST.

"The treatment of pyorrhea by me has been a gradual evolution from the time when I only removed the calculus, or at least tried to, and used some if not all of the astringent drugs that were included in my knowledge of Materia Medica.

"The more I have studied the histology of the tissues involved and the pathology of the disease, the more convinced I have become that in the majority of cases people suffering from pyorrhea alveolaris have some other pathological systemic condition acting as a predisposing etiological factor.

"I do not wish to be misunderstood as advocating that all cases of pyorrhea are systemic, nor do I believe from my clinical experience that all cases are the results of local irritation. We must use our common sense and diagnose each and every case.

"In my method of treatment, I made a complete physical diagnosis. In doing this, I keep a record on the accompanying card, giving data of temperature, pulse, blood pressure, heart examination, haemoglobin, red and white blood count, blood smear, differential count of leucocytes, and a complete urinalysis. I also make a smear of pus, examining for micro-organisms and endanneba. We now have all the physical data on the patient and are able to make a diagnosis. If we find the patient suffering from any grave systemic disease, we refer him or her to the family physician. In the great majority of cases, especially if the patient is leading a sedentary life, we find a history of faulty elimination, acidosis, indicanuria, and deficient elimination of urea. (Figs. 106-7-8.)

"This condition we strive to correct by proper systemic treatment at the same time we are locally treating the case.

"Regardless of the enthusiasm of Drs. Barrett, Smith, Johns, and Bass relative to the use of emetine hydrochloride as the proper treatment of pyorrhea, we think it conclusively proven that scientific root surgery offers the only reliable treatment of pyorrhea conditions to-day.

"We approach the disease from the constitutional aspect, believing that for every effect there is a cause and that every law of medicine enjoins us that, if the cause is not removed, we shall continually have a recurrence.

"A great many of our cases are cases of mouth infection, and we have pyorrhea complicated with rheumatoid arthritis, endocarditis, myocarditis, lesions of kidney, and various diseases of the gastro-intestinal tract. In these cases, we inoculate culture media from the deep pyorrhea pockets and have an autogenous vaccine prepared, which is used to raise the resistance of the patient to the prevailing micro-organisms.

"In our local treatment, we sterilize the field of operation in the mouth as thoroughly as possible, using iodine, then curette the pockets and plane the infected surface of the cementum. After we have curetted from the pockets all gangrenous peridental membrane and necrotic alveolar process and planed the cementum, we have a blood clot filling the pocket. This, if we can prevent it from becoming infected, acts as a matrix for new granulations to fill the pocket, healing tight around the tooth root. To prevent the ingress into the pocket of food, saliva and debris from the mouth, as well as micro-organisms, I have not found anything better than the No. 1 and No. 2 AA Pyorrhea Treatments of Adair. (The method of preparing these is given in another chapter.) This preparation, when in contact with the saliva, thoroughly seals the pockets for from twenty-four to forty-eight hours. The application may be renewed as frequently as necessary until healing takes place.

Name Mrs F Case

Address Elmira, N. Y. Date Oct. 7, 1914.

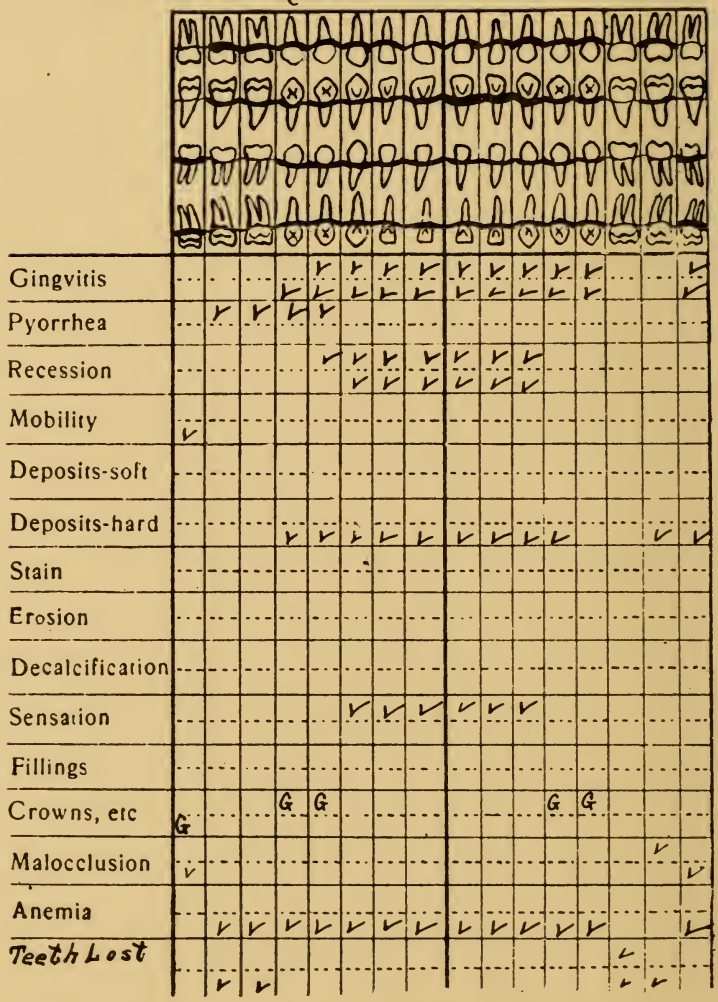


FIG. 106. THE EXAMINATION AND HISTORY CARD FOR PYORRHEA CASES AS USED BY DR. J. B. WEST.

HISTORY

Sex Female Age 38 Occupation Housekeeper
Married or single Married
Local Condition
Soft tissues Upper gums purplish with red, inflamed gingival margins. Lower gums anemic
Saliva Negative

Tendency to Caries During Pregnancy
Wearing No Erosion No

General Conditions
Diet. Appetite good. Meat eaten once per day. Fruits in season.

Habits. Very little walking owing to lameness.

Hereditary factors. Negative

General health Poor for 4 yrs. Pain in joints Only when used.
Muscles in left arm at night Headache No
Rheumatism Chronic Arthritis Asthma No
Constipation Yes Kidney Disease No
Liver or venereal disorders History of jaundice once.
Tuberculosis No Stomach disorders No
Nervous lesion No
URINALYSIS Oct. 5, 14 Amt. in 24 hours About 2 qts.
Sp. Gr 1.018 Color Amber Transparency Clear
Reaction Acid Degree of Acidity 20°
Indican None Sugar None Albumen None
Urea 3.1% Uric Acid No Blood —— Pus ——
Gas. int. tract.

Remarks Roentgenograms were made of both upper and lower jaws and five distinct foci of infection were located at the apex of the carried teeth.

FIG. 107. BACK OF FIGURE 106.

HISTORY AND PHYSICAL DIAGNOSIS

Temperature before treatment....99°.... ..Middle.98 2/5°. After........

Pulse before treatment...96.........Middle...80. .After.................

BloodPressure Determinations

Part examined Left Arm...Posture Sitting .Pulse rate 32 ; 33...

Before treatment....................Middle............ . ...After...................

Systolic..100........mm Hg.....95.......mm Hg.. ....mm Hg

Diastolic...68..................."..62............"................................"

Pulse Pressure...32..........."...33........."................................"

Mean Pressure...84..........."...78.........."................................"

Date..Oct. 8, 14 ; Nov. 9, 14. ....Hour.3.30 P.M. ; 3 P.M.

Ausculation of Heart

Mitral area Increased 1st Sound Pulmonic area...Normal.............

Aortic area: Normal.....Tricuspid area...Normal...............

Remarks...

Examination of the Blood

Haemoglobin. Before treatment.....75.... .Middle..75....... After.........

Stained Blood Film....Yes......................Stain. Wright's.............

(a) Red Corpuscles...

Poikilocytosis....No............ ....Stippling..No.........................

(b) Differential Count of Leucocytes Not Taken in this case.

Polymorphonuclear Neutrophiles in 1 c. mm...................................

Lymphocytes in 1 c. mm.................. .Eosinophiles in 1 c. mm..............

Transitional Forms. In 1 c. mm. ....Basophiles. in 1 c. mm............

Turks Irritation Forms. in 1 c. mm..

No. of Red Corpuscles. Before treatment 5,500,000 Middle 4,000,000 After.......

No. of Leucocytes. Before treatment 9000 ...Middle 8000.....After...........

Second Urinalysis. Date...Nov. 9, 1914...................................

Amt. in 24 hrs....................Sp. Gr. 1.023 .Color Amber Odor Negative

Transparancy Cloudy .Reaction acid ....Degree of Acidity..30. .Indican None

Albumen..None....Acetone..——........Sugar..None....Urea..2%+...

Uric Acid..Yes........Blood...No............Pus..——.......................

Bacterology

Pus from what part of body Blind Dento-Alveolar Abscess & Pyorrhea Pockets

Smear.No........Stain——..........Culture.Yes.......Autogenous Vaccine..Yes ..

First dose, No. of Bacteria Streptococcus viridians 6bM .Date. Oct. 1914

Last dose, No. of Bacteria..1,500,000,000.......... ....Date. April 1915

How often given, and No. of doses About once a week...............................

Diagnosis. Arthritic Deformans due to Oral Sepsis...................

Prognosis. Fair owing to destruction of joints.......

FIG. 108. Physical diagnosis sheet of Dr. West. When made out is pasted by edge to card as shown in figure 106.

"If we can prevent pressure and infection, according to the research of Macewin of Glasgow new bone will be thrown out by the osteoblasts at the margin of the freshened alveolar process and the tooth will be much firmer in its socket.

"We realize that this doctrine is revolutionary, but Hartzell, Logan and Fletcher, as well as the author, have noted it as a clinical fact.

"After the local surgery has been finished on the various teeth, we have found that it is necessary to keep the teeth perfectly clean and the surfaces polished by oral prophylaxis, as advocated by D. D. Smith. The granulations filling the pocket are, like any other scar tissue, tender and unable to withstand the abrasive action of foods during the process of mastication and must be stimulated by massage and contracted tight around the tooth. We use an alcoholic solution of the sulphocarbolate of zinc applied by means of cotton rolls, as advocated by Skinner, or Talbot's massage brush. This wash with massage is applied to the gums twice a day after the pockets have healed.

"We check up the physical condition of the patient at the middle of the treatment and at the close, as shown on the history card. By this means, we have the complete data of the patient before treatment and at the close and can show him the actual improvements in his case." (Figs. 106-7-8.)

THE TREATMENT OF PYORRHEA ALVEOLARIS WITH SUCCINIMIDE OF MERCURY, BY DR. G. H. REED.

The latest claim for victory over pyorrhea comes from Dr. G. H. Reed, of U. S. Navy. He reports in "Items of Interest" for April, 1915, several cases treated by deep injections of succinimide of mercury into the muscles of the buttock. The first injection was seven-fifths grain. This was followed by an injection of one grain after an interval

of three days, and by three-fifths grain three days later. The claims set forth for success of this method is that the mercury is an amoebacide, germicide and produces a hyperaenia and tonic effect in the gums. The author has not had the opportunity to experiment with this remedy, but the success of this method for the treatment of tubercular cases and other parasitic diseases leads us to look forward to further experiments and reports.

CHAPTER XXXI.

THE AUTHOR'S METHOD AND SYSTEM OF TREATING PYORRHEA.

For the first time the author is afforded the proper opportunity of giving in full detail each step in a systematized method of treatment which has for many years proved highly efficient in his practice.

While many papers have been read and published and clinics given, only parts of his work could be presented. For this reason many of these contributions were not thoroughly understood nor were the methods generally adopted; but the author has the satisfaction of knowing that some dentists who have visited his office and seen his methods in practice have adopted them successfully.

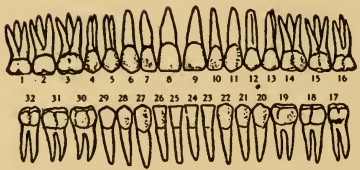
The author's treatment, having proved so successful in his own hands, it is herewith given in full detail with the hope that it may prove equally useful to others.

In the description of this treatment we will consider that we have a case of pyorrhea where the teeth are loose, the gums swollen, and the pockets are of medium depth containing some cheesy disintegrated alveolus; in other words, a typical case of pyorrhea.

Several days before the surgical work the patient is given several sittings, at which time the mouth is sprayed out with some antiseptic solution or AA Dental Mouth Wash.

Each time the mouth is mopped out with a "Kuoris," the cotton having been dipped in a weak solution of hydrogen peroxide and then applied to the gum surfaces. A coating of Skinner's Disclosing Solution (formula given page 176) is next applied; other good antiseptic solutions for this preliminary treatment are:

ORAL PYORRHEA CHART



Name Mrs. S. M. Grant

Address 647 Boulevard

Date 1/15/15

EXAMINATION 1. No. of teeth involved 2-5 26-23 30 31 2. No. of teeth with deposits on enamel and no destruction of peridental fibres 14 5 3. Teeth with pus discharge 23 5 26

4 Teeth loose with no pus discharge 5. Condition of teeth Fair.

mucus membrane Red, bone Carious 30 29 25 character of deposits Salivary Calculus

Occlusion Good Prothesis worn Fixed Bridge 11 6 15 Fair only.

HISTORY 6. Age 45 7. Duration 10 yrs 8. Beginning point of inflammation Lower Incisors

9 Most recent point of inflammation 30 10. Habits Good Tobacco Used to Alcohol

Oral Hygiene As a rule pays little attention to brushing Tooth Powders Used to Brush

11. Parents teeth Father lost teeth with Rigg's. Mother had good teeth.

SYSTEMIC CONDITION Very nervous - Headaches Blood pressure 140

Urinalysis Sp. Gr. 1020 Large amount Indican

Saliva thick 12. Have you had any trouble with your digestion? Yes

13 Have you had any pain in your abdomen? No 14 Which did you notice first—trouble in mouth or stomach? Mouth? 15. Have you had any heart-burn? Yes 16. Do you notice any excess of saliva after eating? No 17. Have you any tendency to Diarrhea or Constipation? Constipation Do you use laxatives? Yes 18. Do you have Tonsillitis? No

Rheumatism? Yes Gout? No Shortness of breath or palpitation on exertion? Yes

19. For what other diseases have you been treated? Indigestion

20. Are you under care of physician at present time? Dr. Jones.

PROGNOSIS 21. Good 14 5 Fair 30 Doubtful 25 24

Hopeless To be extracted 22. Prosthesis indicated

TREATMENT and results. Mg Sulph 1 Z every morning for 10 days. Scaled all teeth at one sitting. Washed out pockets with Hot Carbolized water. Treated for 2 weeks with Alt Pyorrhea Treat. Alcresta Ipecac internally. Patient taught brushing - Polished up teeth - Wire splint on lower incisors - Dismissed patient 3/6/15. Results good - No indican, Indigestion better, Lower blood pressure.

FIG. 109. A simple record chart as used by the author. The pockets, amputations and bridgework are marked in the cut of teeth at top of sheet. These are put in a loose-leaf binder.

DR. MEDALIA'S MILD ANTISEPTIC SOLUTION.

Compound solution of iodine (U. S. P.)	aa drs. ss
Glycerine	
Distilled water	grs. ii

DR. BUCKLEY'S PYORRHEA ASTRINGENT

Potassium iodide	
Zinc phenol sulphonate	aa grs. 60
Iodine	grs. 80
Water	m 192
Glycerine	grs. 100

The most important instrument for application of any medicant into a pyorrhea pocket is made by mounting a small size quill tooth pick on an orange-wood stick for a handle. Those who have seen the author use this quill applicator, have expressed wonder at its efficiency to deliver a proper dosage of medicine to the bottom of a pyorrhea pocket. It works just as the point of a writing pen. Dip the quill into the medicant, carefully insert to the very bottom of pocket and then manipulate the handle just as in the use of a writing pen. This will "write" your medicant to the bottom of the pocket. The Miller pen is somewhat on this order, but does not possess the advantage of a quill in its narrow width and length of point. The quill is not affected by any of the medicants used in treatment and has the advantage that it enables the operator to use agents which no syringe will stand or deliver. With all the other means I have employed, the liquid "came back" and with this applicator it "stays put."

This preliminary treatment has the advantage of getting acquainted with the patients, gaining their confidence, and getting rid of any bad odor. By staining the debris around the tooth it is more easily removed.

Dentists differ considerably on the question of extensive surgical procedure at one sitting. The general practitioner can not give so much time to one patient, and it is advisable in this case to take only a few teeth at each sitting. Dr. Hartzell takes only a few teeth at each sitting for an entirely different reason. In his work he has seen some evil

results following extensive work, such as chills or rise of temperature. He further believes that pneumonia, joint infection, or acute nephritis might result from opening up large areas of this granulating tissue which might introduce bacteria into the circulation.

These grave dangers are more than a possibility if the operation is undertaken in the ordinary manner, but the technique as used by the author, has not only prevented such complications, but gives better results from completing one jaw at least at each sitting.

This is due, of course, to the preliminary treatment which destroys most of the bacteria and parasites, also to the thorough irrigation previous to the operation, and the further fact that each instrument introduced into the pocket carries with it an appreciable amount of cyanide of mercury solution, which gives very little chance for live germs to exert their action in the circulation. This technique has been carried out in a large number of cases without a single complication, and most of these have been all finished at one sitting.

This is to the advantage of both the patient and the operator, because all the instruments and solutions are made specially for each case (just as in a hospital case) and to do this all over a half dozen times does not gain anything for either party. However, the greatest reason we endeavor to finish all of the operation at one sitting is that it is the *logical thing to do,* for in this manner we eliminate all chances of a reinfection into an operated-on pocket from another one which has not been treated. Partial surgical operators are rare occurences. They can be made so by the dentist with equally as good results as to the surgeon.

On the hour of appointment for the operation the room and instruments are prepared just as for any other surgical operation. All the instruments needed for the operation are thoroughly cleaned and sterilized, the instrument table

is wiped off with alcohol and a sterile napkin is placed on the table, upon which are laid all of the instruments.

The point of beginning the operation having been selected —generally the right side of the upper teeth—this section of the gums is dried off with cotton or bibulous paper and either a solution of 5 per cent cocaine is applied or, better still, a fresh solution of Novocaine. Dr. Julian Smith, of Austin, Texas, has called our attention to the mistake many operators make in using solutions containing adrenalin. We have a congestion of these end organs, an area loaded with foreign material, germs, and parasites which a free flow of blood greatly benefits, and the use of adrenalin in any form defeats this action.

Cocaine gives the best results for injecting into pockets with a blunt needle. If cocaine has any proto-plasmic poison action, it can not exert it here because of the poor circulation when it is placed and the irrigating process of the blood during the operation.

The infiltration method and conductive anesthesia, using novocaine, are most useful when one portion of the jaw only is affected, or where only one section at a time is operated on. The anesthetic is also inserted into the pocket with a clean hypodermic syringe, using for the purpose a long steel point. Do not use a sharp needle. The Sharp and Smith needle is most useful, the point is small and not expensive and better than anything I have found or had suggested to me for general use. (Fig. 110.)

Five or six teeth having been anesthetized, we are now ready for the surgical work. Great care must be exercised that the gingival margin be not injured for at this border there seems to be a fibre which acts like the draw strings on a tobacco sack and when once severed, it is never reunited. It is a good plan to pack small shreds of cotton saturated with the anesthetic into the spaces between the

teeth, keeping the portion free from saliva for a few moments until completed anesthesia is obtained. Generally the beginning of pyorrhea at the gingival border is more painful than the deep pockets so this method is most important to use.

FIG. 110. A SMALL, INEXPENSIVE STEEL POINT ESSENTIAL IN PYORRHEA WORK.

We endeavor to use the instruments so as to give the minimum amount of pain. However, it sometimes happens that the very case in which we expect the least pain, is the most sensitive. The patient's fears are allayed when they see the operator is taking steps to prevent pain.

As the manner of using the various instruments is described elsewhere, this part of the work is omitted from this chapter. The author believes that proper instrumentation is the only solution for the cure of pyorrhea.

In a systematic way begin at the gingival opening of pocket and gradually proceed towards the apex of the tooth until the sense of touch tells us that the instrument has removed all deposit and dead membrane and reached the extreme depth of the pocket. (Fig. 111.)

While each instrument is in the hands of the operator, he should operate on just as much surface of the tooth or teeth as possible, that is, he should go as far as he can before another instrument is taken up.

When through with an instrument or before placing it in a new location or pocket it is dipped in a glass having an inch of its depth filled with smallest size shot covered with antiseptic solution. By dipping instruments into this glass we not only disinfect the point but the shot effectually cleans the edge from any adhering matter or blood clot.

This suggestion, if put into practice by the reader, will be worth the price of this book. Just an ordinary heavy drinking glass is mounted in a frame, and conveniently placed so that the operator can reach it without moving his position at the chair. The shot can be covered with a 10 per cent. Lysol solution (objectionable on account of its odor) or, preferably, a 1-500 cyanide of mercury solution. Before an instrument is put into the pocket, it is plunged through the shot, given a twist, and it comes out clean, and with just enough of the antiseptic solution clinging to its point to act as a real germicide in the pocket.

At the end of the operation, all instruments used should have accumulated in this glass. This method of handling the instruments effectually sterilizes them. They are then washed or boiled, dried, oiled and put away in a formaldehyde sterilizer ready for next operation. To clean the surface of mirrors and pliers during any dental operation, this little suggestion will prove most valuable.

Each selected section is taken up and finished before scaling other teeth. A section as spoken of means from three to four teeth.

The "root planing" having been completed, I take the proper Smith's files and smooth off all roughness which may remain or possible grooves cut in the teeth. With Adair's small bone curette the disintegrated bone and sharp edges of the alveolus are most carefully removed, its point, having a rounded end, will not remove sound tissue. Any carious bone or sharp corners of alveolus would retard the healing of tissue over it. A delicate sense of touch and experience is imperative in using a curette in pyorrhea work.

Scaling of teeth has been practiced since dentistry was a profession, but few have achieved that degree of skill which could by the sense of touch remove all the dead peridental membrane and this porous coat from the dense surface of the cementum.

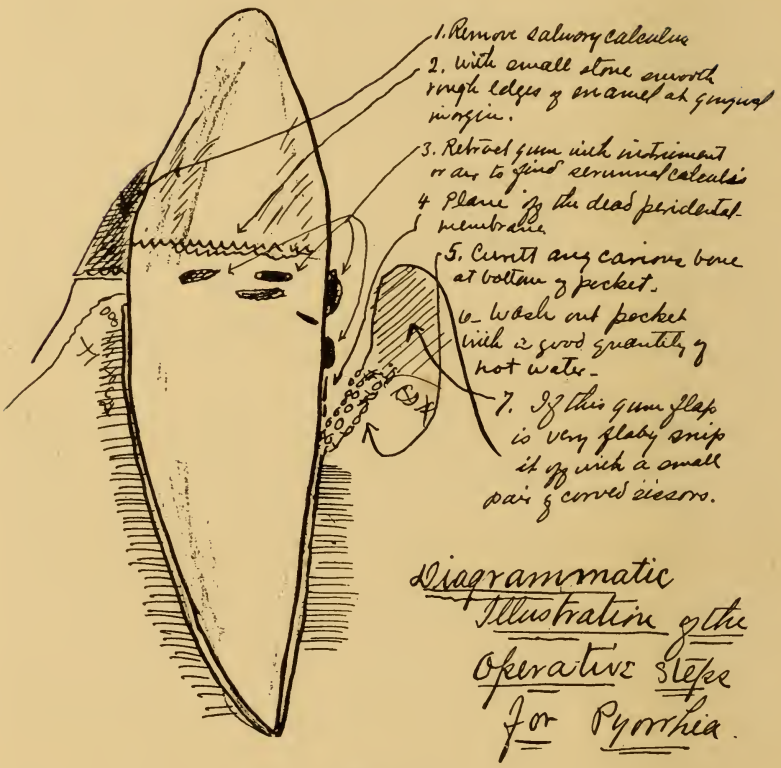


FIG. 111.

Instruments should as nearly as possible be selected which will work in effect like a straight instrument. This relieves the muscular tension and aids our tactile sense. We are thus in better condition to tell by the feel of instrument what we are cutting.

If the pocket be a recent opening, the peridental membrane will not have become hardened, and our instrument will convey a fleshy sensation. If tartar is encountered, a gritty feeling is apparent. When the proper degree of scaling has been attained, the root surface gives the sensation of trying a new blade or scaler on the handle of a tooth brush.

Carious bone feels much like tartar. Very gently correct such surfaces until the feeling gives a harder and smooth surface.

One of the greatest aids for thorough work is the use of a good compressed air syringe, such as that made by the A. C. Clark Co. However any of the syringes applied with switch-boards would answer. This one is the least in the way.

A stream of warm compressed air at from twenty-five to forty pounds is directed into the pocket and if the latter contains any foreign material, calculus or serumal tartar, it can generally be seen. This syringe can be handled by the operator but it saves time to have the assistant trained to do it.

FIG. 112. THE CLARK AIR SYRINGE, WHICH THE AUTHOR FINDS THE BEST FOR HIS WORK.

In working on the lower jaw, it is advisable to have the saliva ejector in place, using the compressed air syringe in the manner above described. The air distends the gum from the tooth so that with the mirror, the operator can see and remove the smaller deposits which, when dry, show up so much better than when in a moist condition.

When cleaning teeth or removing tartar, place the electric mouth light on one side of the alveolus opposite the root of tooth to be cleaned; you will be able to locate the tartar on the opposite side and by reversing the light from side to side, enables the operator to find tartar deposits even if they extend almost to the apex of the roots.

Having satisfied myself that the teeth are surgically clean and that the disintegrated bone and sharp edges of the alveolus are rounded off so that the soft tissue or gum can festoon itself over the surface without any irritation from projecting bone, the entire surface operated upon is then washed out

FIG. 113. A case of pyorrhea alveolaris, showing an abnormal growth of the inter-proximate gum tissue. There is no use trying to treat a case like this without excision of these projections. They are often tough as gristle and if left serve as doortraps for food and bacteria. Insert a needle just above in true mucus membrane and place a minute quantity of anesthetic. Almost immediately you can remove them without pain. Use a small pair of curved scissors or sharp lancet. Be sure and cut high enough to get all the hard tissue the first time. After the first cut it is hard to make a smooth surface. These surfaces heal up in a remarkably short time. Arrow indicates direction of cut. Always cut toward the tooth.

with a liberal supply of warm water, normal salt solution, or, better still, an antiseptic solution. This solution is placed in a spray bottle, having for a point the Good needle which we advised for use in the hypodermic syringe. Plenty of solution should be used; a full spray bottle is not too much for each jaw.

Another apparatus which I use with good results is that used by Dr. Conrad Deichmiller, consisting of a Valentine irrigator placed near the ceiling and a common bulb syringe inserted at the end of tube to get a greater pressure. This

is not only a useful apparatus for the treatment of pyorrhea, but in other dental surgery as well, such as washing out the antrum, abscesses, etc. A quart of hot normal salt solution should be used in this apparatus. (Normal salt solution is made by adding one dram of salt to a pint of sterile water.)

The entire area of the diseased gums is thus systematically gone over in turn. Whatever success the author has had in the work, he believes it is due to the thoroughness with which the surgical technique is carried out. If any scale of deposit, any carious bone, or a sharp edge is left, that particular place will not heal, and if it shows up before the patient is dismissed the pocket is again opened up and this irritant removed.

FIG. 114. This picture shows a carious condition of the process around a lower molar tooth. The infection has not only followed the tooth root, but has extended externally to the periosteum. (Author's collection.) This is the case where the beginner in pyorrhea work is often discouraged. He scales the root surface several times and treats with all advertised remedies; still the tooth is loose, pus exudes and the gum inflamed. This case in practice might have been a curable one. The gum tissue should have been opened down to the bone as far as the arrow point, laid open with a small periosteal elevator and this diseased bone removed with a bur or curette as far as the white line. The gum instead of standing away from the tooth would then be able to hug the tooth and the prognosis turned into a favorable one.

Thorough irrigation with plain warm water or normal salt solution is used for no other purpose than that it will wash out the debris. We do not use any solution which would tend to destroy or prevent organization of the clot. It would be preferable not to wash out the pockets after instrumentation were it not for the fact that loosened scales of deposit might remain to become reattached and give future trouble. If nothing stronger than the solution named be used for irrigation, we find that we have as good blood clot as though the thorough washing had not been done.

It matters little whether all the teeth are completed at one sitting or not, as the field operated upon is sealed from infection from the other parts of the mouth. Whatever section is operated upon, must be finished at this time; if this is not done, when the patient returns in a day or two for another hour of surgical work, we will probably have forgotten just where we left off or whether or not we have finished certain teeth.

In our operative procedure, we will find fillings which have a shelf overhanging the entrance to a pyorrhea pocket and we are prone to leave this for future consideration. However, as we have given this as a causative factor, it should be eliminated almost as soon as found. Sometimes the quicker way to do this is to remove the filling and put in some temporary stopping, waiting until we have finished the operation and can knuckle the filling up in the proper manner without any overhanging edges; ill fitting crowns and bridges should also be promptly removed.

Sometimes the deposit of tartar is so hard that it is good practice to remove it with a bur, placed in the dental engine. It is well to first allow the bur to revolve against a stone so as to modify its cutting qualities in order that it will not gash into the tooth root itself. The burs with long shanks and small heads, as described by Dr. Fletcher, can be used to advantage in removing carious bone or cleaning out be-

tween the roots of the teeth when it is not practicable to obtain sufficient force or effectiveness with a hand instrument.

FIG. 115. This is a case of pyorrhea alveolaris which bled at the slightest touch of a brush or instrument. Here it is not advisable to immediately remove these projectives from the gum as the hemorrhage would be great and often lasts for days. Nor is it advisable to attempt any instrumentation until the case has undergone a preliminary local treatment until the congestion is under control. Dry the gums and apply Skinner's Disclosing Solution, Buckley's Pyorrhea Astringent or AA Pyorrhea Treatment No. 1 and No. 2. Give the drugs used time to run around the tooth, under the gums and time to absorb before letting the saliva to the gum. A week of this treatment will make a much more satisfactory case for instrumentation and excision of any gum tissue. Tough gum tissue as in figure 113 needs no such treatment, but can be removed immediately.

I expect the same healing that I would from any fresh wound that is filled with a blood clot. I do not mutilate the gum at the cervical border. I endeavor to have the operation practically painless and without any great strain on the patient. While our object has been to produce a clean wound sometimes after treating for a few days, we will find a trace of pus which shows that something has been left in the pocket which must be removed. In such an instance it will be necessary to again open up the pocket or to inject some medicant to overcome the infection which has spread into the body of the alveolus. (Fig. 114.)

CHAPTER XXXII.

THE AUTHOR'S METHOD AND SYSTEM OF TREATING PYORRHEA—CONTINUED.

APPLYING DRESSINGS IN PYORRHEA.—METHOD OF MAKING NOS. 1 AND 2 PYORRHEA DRESSING.—DIRECTIONS FOR POST-OPERATIVE DRESSING.—AUTO-INTOXICATION IN PYORRHEA.—SILVER NITRATE IN PYORRHEA TREATMENT.

APPLYING DRESSINGS IN PYORRHEA.

Many cases would undoubtedly get well with the surgical procedure alone, but no medical treatment known will aid these cases unless this surgical procedure has been well done. However, in the same patient, with the same degree of operation on both sides of the jaw, I have tried the experiment of using my medical dressing preparation on one side only. For the first few days the side not dressed showed inflammation, the teeth were elongated, and it was very sore to the touch, while the opposite side where the preparation was used showed no such symptoms. The reason for this is logical. A surgeon who performs an operation, follows it by applying a dressing which has a great deal to do with the proper healing of the wound. For years the dental profession tried and experimented in an effort to get some method of covering the operated surface in pyorrhea work. Some have tried sponge grafting; some, tying strips of rubber dam about the teeth; still others, packing the pocket with strong irritating drugs. The difficulty that we have hitherto had was that the treatment or medicament could not be kept in place. It was immediately washed off by the constantly

flowing saliva. The failure to use a suitable protection left the field of operation a veritable culture tube—the mouth containing stagnant saliva, decayed teeth, and many different kinds of bacteria. Hitherto, the antiseptics we have used have proved failures, for, if strong enough to destroy the bacteria, they have destroyed the membrane of the mouth or kept it in a raw state.

Some thirty-five years ago Dr. R. B. Adair discovered a peculiar combination of iodine, creosote, tannin and glycerine which has proved most successful in the treatment of pyorrhea. He demonstrated this treatment at the International Medical Congress in Washington in 1887, giving his formula to the profession at that time.

The combination was difficult to make and it was hardly possible to get a druggist to correctly fill a prescription for it, hence few dentists adopted it. For this reason we arranged to have it made properly under the trade name of "AA Pyorrhea Treatment Nos. 1 and 2." The application of this preparation under this name was first shown by the author in 1913 at the meeting of the National Dental Association in Washington. This preparation has played a great part in our work and we have by clinic and paper urged a general adoption of its use. In the May number (1915). of "The Journal of the National Dental Association," in a paper on "Pyorrhea and Its Treatment," by Dr. Hartzell, page 139, this application received the following endorsement: "Many substances have been recommended for this purpose. The most valuable one of which the writer has any knowledge is the following:" Dr. Hartzell then described the above mentioned formula.

The name *Treatment* is a misnomer; it should be *Dressing,* as it can be used in combination with any other treatment. Any dentist can make the preparation by following the directions described below but will find it a rather "mussy" procedure.

METHOD OF MAKING NOS. 1 AND 2 PYORRHEA DRESSING.—ORIGINAL FORMULAE OF DR. R. B. ADAIR

Take one oz. chemically pure iodine crystals. Pour over this just enough chemically pure beachwood creosote to cover crystals of iodine. Let stand for 48 hours, then stir thoroughly with a glass or wood rod, making a thick mixture. When this is settled, pour off from sediment at bottom. This liquid is the No. 1 preparation.

Procure large mouth bottle of about 3 oz. capacity such as vaseline comes in. Pack into such a bottle tannic acid crystals. Use a wood rod and pack tight, having one-half inch space at the top of bottle. Into this space pour glycerine C. P.—about one-half oz. Let stand for several days. If on examination the glycerine seems to have reached the bottom, place it on a water bath and leave until the whole has become a thick syrup. If glycerine has not reached the bottom, add a small quantity of glycerine. After heating on water bath, mixture should stand and age for about a week. The mixture will become clear and will have the consistency of thick molasses. This is the No. 2 preparation.

These preparations are rather hard to make in small quantities. They must be just the proper consistency which is best obtained by aging. The preparation as manufactured stands several months before bottling.

Simple cases will need only three or four applications; the severity of the condition and the extent of the operation determine the number of applications necessary. This "dressing" does not stain a clean tooth—really bleaches it—but it does stain every bit of foreign matter on the tooth root. I have found it a good idea to use a few applications before the operation as a substitute for a disclosing solution, as this staining will show up the tartar and other accumulations. It softens and loosens the attachment of accumulations. This "dressing" which we use comes nearer filling

all requirements than anything yet found. It furnishes the strongest anti-septic known and, when used in the mouth, it forms an astringent membrane which seals and protects from any infection. The formation of this preparation is similar to surgeons' collodion. It holds from twenty-four to forty-eight hours and gives the longest period of mouth medication known. We know that the surgeons of to-day are depending more and more upon iodine for sterilization. This "dressing" gives us the constant penetrating effect of this drug. Even though it had no antiseptic properties, the astringent effect upon the gums and the sealing of the gums to the teeth, would make it of great advantage.

Many experiments have been performed outside of the mouth under all conditions but so far we have been unable to effect this peculiar formation outside of the mouth.

The experiment may be tried of placing No. 1 on a dried section of the gum and the No. 2 over it; no combination takes place. Let the patient spit and the moment the saliva comes in contact with the preparation, a membrane is formed over the coated surface. Under twenty-four hours it is impossible to remove the formation from the gums; after this time, it loosens and comes off in small pieces, resembling rubber dam. Instead of excessive hemorrhage from the operation, we have just the minimum amount.

Outside of the mouth, on the hand, or anywhere, the preparations are put on in the same manner and covered with saliva under any and all conditions, but no formation takes place. Why?

DIRECTIONS FOR POST OPERATIVE DRESSING.

THE APPLICATORS.

The applicators recommended are made by dipping the end of wood tooth picks into Sandarac Varnish, and twisting a few strands of dry cotton about the end, these make a secure and convenient swab for painting the gums. Several

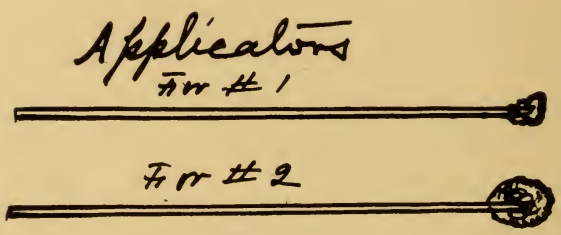


FIG. 116.

hundred of these can be made in a few moments by your assistant, to be thrown away as used. It is absolutely essential that a separate applicator be used for applying No. 1 and No. 2 preparations.

The nose and throat specialist uses a long slander wood applicator which is also of great advantage in treating pyorrhea. These can be used instead of the wood tooth pick.

NAPKINS FOR DRYING THE GUMS.

The application is greatly simplified by the use of small doilies which can be thrown away. These are inexpensive and used in all treatments about the mouth. Buy from your dry goods store, a bolt of English long cloth, costing about $1.00. Mark off the top of bolt into squares about 3x5 inches, some longer, some smaller. Your printer will, with a few strokes of his cutter, convert the bolt into several thousand doilies. These should be sterilized and kept under cover ready for use.

TECHNIQUE OF APPLYING DRESSING.

Immediately after instrumentation and irrigation, the mouth is dressed by drying sections of the gums with the aseptic napkins, which should be held so as to protect the lips and cheek while applying with applicator a coat of No. 1 pyorrhea treatment, giving a moment for absorption; then freely paint over No. 1 with No. 2, letting it flow around and between the teeth; when the napkin is removed and the saliva comes in contact with the medicated gum, the com-

bination of these two preparations forms a membranous coating or dressing similar to that produced by collodion as used by surgeons.

As each section is treated, have patient rinse mouth with dental mouth wash. This at once removes the disagreeable taste and puckering of the pyorrhea treatment. Another section is dried and treated in the same way until all the affected teeth and gums are sealed. It is better to treat the upper jaw first. It is not necessary to have dressing extend more than 1-8 in. from gum margin. Be careful not to seal the ducts of Whorton and Steno, as this would cause a disagreeable swelling of the glands.

The benefits of the iodine contained therein, we all know. The inflammation is deep seated, and iodine is the one agent that will penetrate. The astringent effect is produced by the tannin. This dressing draws the gums to the teeth; food, saliva, and toxic products are thus excluded. The blood-clot in pockets is protected until organized into new tissue.

This dressing is not to be removed for 24 hours. See the patient regularly every day, removing the membranous or leathery coating of the day before from the gums by a gentle massage with a soft tooth-brush moistened in hot water; the mouth is sprayed with mouth wash, and the dressing of No. 1 and 2 is again applied. After a week of treatment it is not always necessary to use the No. 1 as the septic condition is under control, and the subsequent applications may be of the No. 2 alone.

Sometimes, when an excess of these preparations is used on the gums, blisters similar to the so-called "fever blisters," appear in the mouth. When this condition arises, suspend all applications for a few days, until the condition disappears.

The patient's name is engraved on his tooth brush using a small bur in the dental engine, and afterward is traced

with ink. The office assistant keeps these brushes in alphabetical order in a small formaldehyde sterilizer.

This brushing is done with the bristles lengthwise toward the gum. The brush is placed high up and the brushing is done with several objects in view. It not only removes the protective membrane of the AA Pyorrhea Treatment, but produces the best massage for the gums. The stagnant condition is relieved. New blood is enticed by this stimulation and the pressure forces some of the bacteria or its products through its protective barrier or pyorrogenic membrane, which causes the blood to exert its fermentive properties and act just as the use of a vaccine.

At each sitting or treatment the brush is softened in warm water and the teeth brushed *correctly,* as described in the chapter on "Brushing the Teeth;" this removes the pyorrhea "dressing." I have always found it the best policy to brush the teeth myself, having the patient hold a mirror so that he can acquire the proper idea of using his brush. A strand of flat floss silk saturated with dentrifice is then run between the teeth and the mouth is sprayed out with dental mouth wash. The same process of dressing is made again and the patient dismissed for from twenty-four to forty-eight hours.

After the patient has been treated about a week or ten days, he brushes his teeth before me at each sitting and in this manner he is compelled to get a good idea of the technique of brushing his teeth. It is sometimes necessary to take the patient's hand and guide him into brushing correctly. After being taught in this manner, if the patient comes up in the future with case of oral sepsis, no one is to blame but the patient himself.

After treating the patient in this way from two to four weeks, and I am fully satisfied that the necessary tissues have formed to resist the force of mastication, and all signs of inflammation have subsided, several hours are spent in polishing the teeth. Sometimes, I am surprised to find that so

much tartar has escaped my notice and every bit of it will be shown up by "AA Pyorrhea Treatment Nos. 1 and 2." I now turn my attention to this and every scale of accumulation is removed with the scalers, the porte polisher or the polishing wheel.

This "treatment" on account of its staining qualities is not for the lazy dentist, but in the hands of a careful man gives the greatest opportunities for making the mouth perfectly clean and for instructing the patient in the proper keeping of his mouth. Its use has proved gratifying both to the patient and myself.

Before dismissing our pyorrhea patients, we must have them understand that where the gum is receded and the dentine is exposed, tartar is more readily collected and that these surfaces must be kept free from all accumulation. For this reason, these patients are dismissed only on probation and they are instructed to return in a month for inspection, when they are again taken through the "tooth brush drill." We endeavor to persuade all the resident patients to take up our system of monthly prophylaxis either under our own care or that of a dental nurse.

AUTO-INTOXICATION IN PYORRHEA.

Many investigators have attributed auto-intoxication as the cause of many cases of pyorrhea. Intestinal complications should always be suspected and the proper attention given thereto.

The large amount of filth, germs, and parasites in a pyorrhea mouth which is constantly swallowed or mixed with food must in time affect the stomach or intestines. It is not probable that the secretions of the stomach can at all times handle this material from the mouth. When it is passed into the intestines some of this toxic matter is absorbed by the intestines, its structure may become diseased, or the blood become saturated with some form of this toxic matter.

On the other hand, there is as much argument to support those who start with a sluggish liver, inactive kidneys, constipation, germ-infected fecal matter, inadequate elimination with its resultant auto-intoxication thrown into the blood stream to afterwards break out at some location as for instance, the gums around the teeth. But the question comes, would it do so unless the gums were already diseased? No matter which way we believe, the condition is serious enough for consultation with a physician who should recognize the gravity of the situation and cooperate with the dentist by prompt and energetic treatment, for there is nothing we can do to hasten the cure of a case of pyorrhea under treatment as much as the re-establishment of the proper elimination process of the intestines. Bear in mind that auto-intoxication generally occurs in those who indulge in excesses of food and drink. Reduce the foods containing animal proteids. Meat must be forbidden as a food. Fresh buttermilk or some of the artificial varieties must be taken in large quantity to reduce the fermentative process in the intestine by its anti-fermentative property. Insist that the patient drink a large quantity of water, preferably lithia, each day.

The commercial houses by their attractive literature suggest many wonder-working preparations, but just plain old epsom salts will do the work. Begin by prescribing one tablespoonful in water every other morning for four mornings, then reduce to one teaspoonful each morning for one week.

SILVER NITRATE IN PYORRHEA TREATMENT.

One of the most valuable applications the eye, nose, or throat specialists use is some form of silver salt or solution. If properly used, they would be just as great an adjunct in our pyorrhea cases. I have records of cases treated successfully with silver salts when all other methods had proved

a failure. On the other hand, their use has proved of little value in many cases.

INDICATIONS. 1. During your operative procedure, if you find some surface so sensitive as to cause the patient discomfort, no matter what treatment is used, silver nitrate is indicated.

2. If during the post-operative treatment some of the gum tissue will not contract, and remains flabby, the application of silver is beneficial.

3. When the final polishing is done, and patient is about to be dismissed, the operator should take note of all surfaces which present the appearance of semi-decay. Sometimes where the roots of the teeth are exposed, we will find this condition to exist almost completely around the tooth at the enamel root junction. It has been proved beyond question that this treatment will prevent these surfaces from decaying.

THE APPLICATION OF SILVER NITRATE.—All porcelain inlays, silicate or cement fillings must be well coated with sticky wax to prevent the permanent staining of nitrate of silver. The neglect of this precaution has caused many operators considerable embarrassment. A ten per cent. solution of silver nitrate will not discolor, and should be used on front teeth. A 40 per cent. solution offers the best general treatment. In stubborn cases, a saturated solution may be used. The bottle containing this solution should be wrapped in dark paper and kept in a dark place. Standing solutions soon deteriorate. In the application of silver nitrate to teeth, the surface treated should be kept dry by the use of cotton rolls, not only during application, but for a few moments afterwards.

When a strong effect is desired and we do not wish to include the soft tissues, the following method is applicable. A suitable wire (bronze, platinum, or platinoid) is mounted

in a handle, the point heated and dipped into a bottle containing crystals of silver nitrate. The adhering crystals can then by great heat be melted into a bead. This gives a small silver nitrate stick which can be rubbed on the tooth direct without affecting the soft structures or soiling your hands.

CHAPTER XXXIII.

SPECIAL OPERATIONS IN PYORRHEA.

IMPLANTATION.—BIFURCATION TREATMENT.—REMOVAL OF PULPS.—AMPUTATION OF ROOTS.—TREATMENT OF PYORRHEAL ABSCESS.—BRIDGE WORK IN PYORRHEA.—SPLINTS.

IMPLANTATION.

For many years the experimental surgeons in dentistry have endeavored to find some system whereby lost teeth could be replaced in the jaw by other human teeth. Dr. Younger was one of the first to make a success of this operation and it is to be doubted whether his first technique has been improved upon.

Dr. Kells also makes the practice of the implantation of one missing tooth, but these are planted in a favorable situation. I have seen in his office a lower molar tooth that had been implanted for seven or eight years.

Dr. Robert Good is doing a great deal of this work in pyorrhea cases. His method is so unique and original that I will describe it in detail as I have seen it carried out in his office.

Dr. Good's assistant haunts the places where teeth are extracted, hunting for peculiar kind of teeth. The tooth he wishes is that of an old person, especially if it has an exotosis on the end of the root. The search is evidently successful, for he has large jars of these kept in liquid in his laboratory ready for selection on a moment's notice.

Dr. Good seems to think it a very simple matter, if one can not cure a tooth affected with pyorrhea, to extract the tooth, clean it off, deepen the socket, and force the tooth

back, secured by a retainer of twisted linen or silk thread. If the tooth is out of line, which they frequently are in pyorrhea work, it is rotated with one movement of the forceps.

However, the most original work which I saw was where an upper molar tooth was needed for an attachment for a bridge. A new socket was bored at about the position of the second molar and a large cuspid root, with the crown cut off, was driven tight into place. Previous to the insertion, he had made a platinum coping so as not to disturb the root when he was ready to make this bridge.

He uses no special instruments other than a Younger root reamer. The canal is properly filled and the tooth, having stood in a strong solution of lysol while the socket was being made, without being washed off, was driven home tight. After such a tooth has stood for some four or five months it is generally ready for bridge work.

For the encouragement (?) of those who wish to try this for bridge work in pyorrhea cases, I will say that I have tried it on several teeth, but to this date I have never been able to get one to stick in a pyorrhea case.

Another method of replacing pyorrhea teeth when they are needed for extra abutments for bridge work is by inserting some device made of metal; one of these is made and sold by Dr. Greenfield, of Wichita, Kans. It is a platinum frame work made in a circle which is inserted into the jaw to fit the trefined socket which has left a central core. This method, while possibly the best one now in vogue for attaching teeth to a bridge at the alveolus, is not so successful in pyorrhea cases, because the alveolus, having been partially absorbed, does not give the proper support.

To those who desire to experiment along this line is suggested the following method, which has been tried by several of our practitioners: either drill a new socket or use the old one and select a common wood screw with large threads which will fit the socket tightly. This having been fitted and

cut off to proper length, is unscrewed, the impression taken, and cast in either tin or silver. A hole is drilled in the larger end and the coping fitted. The cast screw is then forced into place and after a few weeks, when the tissues have about resumed their normal state, the crown or bridge is fitted thereon.

After implantation, by the use of AA Pyorrhea Treatment we are enabled to seal the gums to the teeth, prevent infection and keep out all food particles. This preparation will hold from 24 to 48 hours, is an astringent, and really acts as a splint, drawing the gum close to the teeth.

While there are some men who seem to be making a success of implantation work, it can not be said that it is as great a success in pyorrhea cases; greater absorption of the alveolus having taken place together with the greater danger of infection, makes the chance for holding less than in a healthy mouth. Still this is a great field for research work and it is to be hoped that at some future time methods will be devised for overcoming these difficulties.

BIFURCATION TREATMENT.

When there is an exposure of the bifurcation of multi-rooted teeth, especially the lower molar or buccal roots of the upper teeth, Smith suggests making a positive retention cavity between the roots and filling this with hard gutta-percha, forcing it, while soft, against the process and gums and finishing it flush with the tooth. He says, further, that this simple procedure will arrest all recession at this location.

The copper cements also give excellent results in good locations and have the advantage of moulding over the gum tissue without pressure and into nooks where it is difficult to place gutta-percha.

Use cement in a jiffy tube and place finger on opposite side to confine it to the tooth, bone, and gum. The latest

thing I have tried which seems to have proved a success, is the following method:

Select two gutta-percha pulp canal points which will nearly fill the space between the exposed roots. This space is then protected, dried, and swabbed out with a twenty-five per cent trichloracetic acid solution to cauterize and stop any bleeding. Acetone is next applied to the surface so the cement will stick. The previously selected gutta-percha points are now covered with copper cement mixed thin. One of these is run through bifurcation from buccal side, the other from the lingual side, passing each other in the center. Wait until cement gets hard, then with disk and hot instrument finish filling on both sides. By this method the operator knows the cavity is filled, no undue pressure is exerted on the bone or gum and is easy to accomplish. This procedure will save teeth that otherwise must soon be doomed for the forceps.

REMOVAL OF PULPS.

Whether or not it is best to remove pulps in operating for pyorrhea, is a subject which has not been agreed upon. There are operators of well known ability who never destroy a pulp if they can avoid it. Other dentists, equally capable, destroy pulps in pyorrhea work. These latter men claim that in the removal of the pulp, the nutriment is diverted to the outer surface of the tooth, where it is most needed. It has not yet been explained by these operators, the modus operandi of this changing of nutriment. They claim that a devitalized tooth is never attacked by pyorrhea, but it has been borne out by observation that this is not true, nor does the author deem it advisable to remove the pulp of the tooth for the purpose of curing pyorrhea, for if there is ever a time when a tooth needs all the vital force and nerve energy which it originally possessed, it is at the time when it is lame from pyorrhea; whatever results have been attained from the removal of pulps, were in those ad-

FIG. 117. Teeth representing a condition of hypercementosis frequently met with in pyorrhea cases. To attempt to remove the pulps and fill the canals of such teeth as these is beyond the skill of most dentists. From an examination of just the crowns of these teeth they would be thought normal. (From author's collection.)

vanced cases, where the pulp was infected by the extension of the disease or was cut off by tartar deposits at the end of the root. Such teeth are generally extracted, but the teeth which we leave for operative procedure seldom have pockets extending to the end of the roots. It is not advisable to remove these pulps. However, if extra sensitiveness, due to infection, is a constant symptom, it is advisable to remove the pulp; remember that it is a peculiar coincidence that teeth affected with pyorrhea seem to have the most crooked roots. (Fig. 117.)

AMPUTATION OF ROOTS.

If, on examination, the probe can be pushed entirely around the root of any multi-rooted tooth, and over the

apex, then it is useless to attempt to save this root as it only constitutes a foreign body, and together with the surrounding pocket, forms a trap for future infection and food. In such cases, provided the other root or roots have good attachment, amputation of the offending root may be effected and the remaining portion of the tooth made to do service

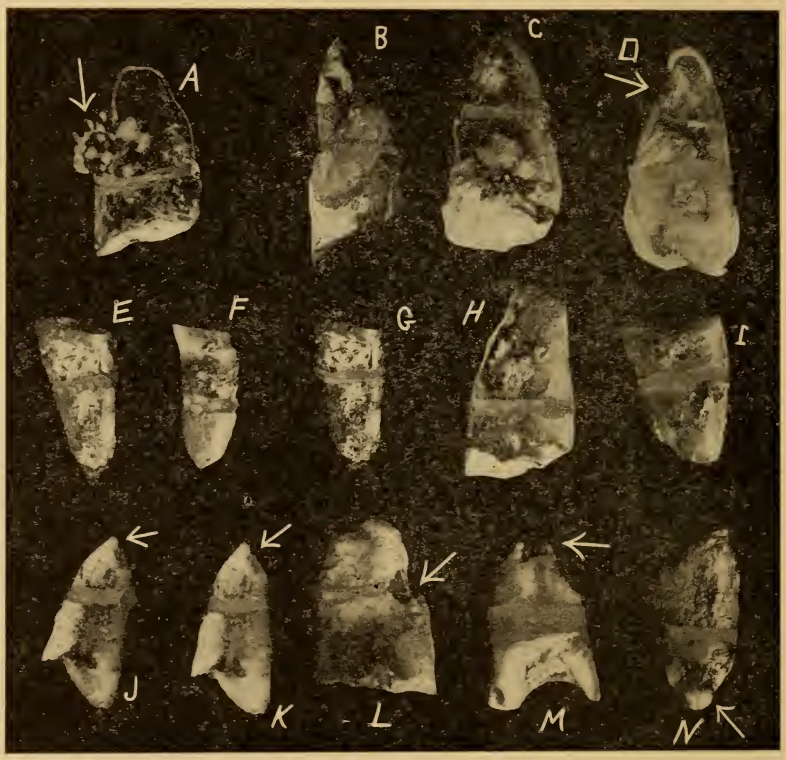


FIG. 118. Amputated roots from pyorrhea cases. (A) The largest mass of serumal calculus which the author has ever seen under the gum margin. It resembles a clump of oysters. (B) Calculus at end of root. (C) Lower molar root removed because bone was destroyed on two sides. (D) Eroded root. (E. F. G.) Removed because of loss of bony support. (H. I.) Serumal calculus. (J. K. L. M.) Root absorption. (N) Excementosis. The teeth from which these roots were amputated all did good service. Some few had to be extracted after several years, but others seem to be as good teeth as any the patient has. Some of the above are bearing bridges. (From author's collection.)

for years. There has been a great deal written on the subject of amputation of roots for alveolar abscesses, but few men outside of specialists in pyorrhea seem to have realized the great value of this simple surgical procedure.

I have performed this operation successfully in several hundred cases. Many of these teeth so operated on over eight years ago, are still proving successful abutments for bridges. I am therefore led to urge upon the general practitioner the adoption of this procedure as a routine method in suitable cases.

Many dentists with whom I have talked, have expressed the idea that it is extremely difficult, and that they were afraid to undertake it. This is an erroneous supposition; the field for operation is uncomplicated by any important anatomical structures, such as nerves or arteries, and is easily accessible, without much cutting or the necessity for an anesthetic. In pyorrhea work this operation is confined to multi-rooted teeth, that is, molars. The one thing to be decided before determining to amputate the root of the tooth is that the disease and the destruction of the surrounding bone is confined to this one particular root.

The most frequent places where amputation is needed are: first, the palatal root of the molars; second, the posterior buccal root; third, the anterior buccal root. On the lower molar teeth we most frequently amputate the posterior roots; these are the most difficult roots that we have to remove.

This operation, to be satisfactory, requires that the root be normally separate from the other root, or roots, that is, they must not be fused together for their full length. The small curved probe or pyorrhea instrument can be introduced between the roots to determine this. If the root is anastomosed almost to the top with its adjoining root, the case is not one for successful operation. This caution applies particularly to the buccal root of the upper molar, as it is very seldom that a complete union of the palatal root

or the lower molar root takes place. Before beginning the operation, it is advisable to remove the pulp of the tooth and fill the pulp canals in the best way possible, for after one of the roots is taken out, it is very difficult to find the canals. However, the writer has frequently removed roots of teeth without paying any attention whatever to the tooth pulps, for the shock of going straight through so paralized the nerve that there was little pain to the operation. The best instrument for this operation is a long shank cross cut fissure bur. This is to be used in a right-angle hand piece. The bur is introduced in the bifurcation and with engine revolving rapidly give the hand piece a saw-like motion towards the crown of the tooth; this produces the proper slant for easy removal of roots and self cleansing space; the angle at which we point the hand piece towards the crown of the tooth has all to do with the easy removal of the separated root. As a general thing, after separation of the root, it drops back into the pocket which surrounds it and can be easily withdrawn with a pair of pliers. As the tooth upon which we are operating may be loose, the operator always braces the tooth securely, either with his hand or by placing a small amount of warm modelling wax against several of the teeth, making a brace so as not to have any undue force on the part of the tooth which we wish to preserve.

It is not advisable to start on one side of the tooth and later remove the bur and again begin from the other side of the root, as this makes a ragged operation. However, this may have to be done in some cases. The root having been removed, the next step is to polish the surface from which it was removed, so that there will be no sharp or jagged edges to irritate the gums or catch food. If the tooth is a large upper first or second molar, it is sometimes advisable to remove that part of the crown of the tooth that overhangs the place where the root came from, as too much leverage would tend to tip the tooth in that direction. This is not so necessary in the lower jaw, as here the crown

of the tooth is braced by the adjoining tooth. The socket from which the root was extracted needs very little attention except to be thoroughly washed out with warm water and some mild antiseptic solution to keep it free from food until it fills up. In some of our cases it is hard to tell that an amputation has been done, as the gum soon falls into place where the root was removed.

As this operation is performed in such a manner that the parts are easy to keep clean, it has not often been found that any decay set in from exposure of dentine. Sometimes it is very important to make correction of malocclusion in these teeth in order to prevent any undue force being put upon a tooth which is naturally weaker than normal. In fact, it is a good idea to lower the occlusion on a tooth from which a root has been taken.

The prettiest result of root amputation is where the remaining part of the tooth is to be used as a bridge abutment. Every abutment which can be used in bridge work adds to its strength and should be saved, especially in pyorrhea mouths where all the rest of the abutments may be in a shaky condition. We have all observed in a boat landing where piles were being driven, that one or two of them seemed loose, but when lashed together an ocean steamship could hardly shake them. In the same way it is desirable to give every possible support for bridge work, even though some of them, alone, may seem very weak.

In using these teeth for bridge abutments it is desirable that the whole of the crown be removed and small platinum coping be placed just under the gum margin. I have always found this to be easier and of better success.

TREATMENT OF PYORRHEAL ABSCESS.

If the operator is familiar with the formation of a pyorrheal abscess (described on page 321) the treatment is a simple matter.

The patients come in very much alarmed at the sudden condition of one of their teeth. This alarm can be quickly turned to quiet and confidence if the proper treatment is given.

Do not attempt to lance the swollen area, but with a Younger instrument, Number 1 or 2, carefully insert at cervical edge between gum and tooth toward the swelling. This should not hurt the patient; almost the weight of the instrument will be sufficient to enter the pocket and allow the pus which is under pressure to escape. Now, at this stage, do not attempt to do any root scraping or planing, but with a small pointed syringe insert at the point where the instrument was passed and using gentle pressure wash out the cavity. Repeat this several times. Do not use any strong irritating liquids, but use either hot normal salt solution or water with phenol, five drops to six ounces. This operation should be repeated the following day.

At some subsequent date when the tissues are less painful, the tooth should be treated for the pyorrheal condition.

BRIDGE WORK IN PYORRHEA.

In treating a case of pyorrhea, bridge work is often necessary. The character of this work has a great deal to do

FIG. 119. STYLE OF BRIDGE WORK MOST USEFUL IN PYORRHEA MOUTHS (THIERCH).

with the permanency of our results; many specialists prefer to do this mechanical work themselves according to their own ideas, and in fact, one or two specialists will not accept a case referred to them by other dentists unless this provision is made. The reason for this is that considerable deviation from the regular established system of bridge work is often indicated, in that we have to use more teeth for support than we would in a normal mouth.

In the construction of this work all sides of the abutment teeth should be accessible for instrumentation, and the central idea for bridge work of this kind is that it must be so constructed as to be easily cleaned by the patient. This fact is sometimes lost sight of by the mechanical man whose sole idea is to restore the lost teeth and to fill the space completely.

FIG. 120. LINGUAL SURFACE, UPPER JAW, BRIDGE WORK IN PYORRHEA CASES

After finishing our treatment, if we find several teeth still loose and several to be replaced, we can not only replace the lost teeth, but can bind the loose ones together, furnishing the best kind of splint. Thus the pressure is distributed over a larger area so that it is not too great on any one tooth. For any extensions on the bridge, it is well to make saddles to extend on either side of the alveolar ridge so as

to give the extension support from lateral strains. All soldering of abutments should be as near the occlusal surfaces as possible, so that we may have better access to the root surfaces in case a pocket develops there at any time. Smaller amounts of solder can be used if platinum wire is soldered or waxed in and cast into the abutments at the places of joining.

SPLINTS.

Many varied and ingenious devices for the retention of loose teeth in pyorrhea have been described in dental journals and demonstrated in clinics; the author discusses, in the following pages, the use and making of splints.

The very fact that teeth have to be splinted in order that they may be saved, makes them a source of frequent infection, and they will need frequent attention from the dentist to keep them in proper shape.

Splints are of two kinds, temporary and permanent. The temporary splint is of greatest advantage. It is sometimes well to use some form of temporary splint at the time of operation so as not to give the teeth too much strain during the operation. If this is not done, it is well to do so after the operation, so as to give the teeth a rest and chance to regain some strength. This applies particularly to the lower anterior teeth and the superior laterals.

Perhaps waxed floss silk, laced in between the teeth in figure 8 fashion, forms the best temporary splint; this can be removed every day or two. To prevent the splint from slipping down into the gums a little cement can be placed upon the surface of the teeth. Orthodontia wire is also excellent for this purpose. Dr. J. W. Jungman suggests the following: "Roll out the ordinary Angle orthodontia wire to a ribbon; anneal and gold plate. Start from left to right by forcing the wire down between the bicuspid and cuspid; then lace it, carrying the strands over and under so as to lock them. At the right cuspid, wind one strand around

the other, and force it between the cuspid and bicuspid so as not to irritate the lip. Where there are one or two loose teeth, I usually carry to the adjoining teeth only."

Dr. Spies' illustrations show a form of temporary wire splint which need not be changed, is clean, and if properly applied does not draw the teeth together as does the silk. It is made by using 26 gauge gold ligature wire for the slip-noose and 30 gauge for the wires between the teeth. Make a slip-noose over the teeth to be enclosed, by bringing one end of the wire over the other, but not twisting them together. Cut short pieces of wire to be used between each two teeth, twist the ends together, and draw tight. These wires should be cut to such length that the ends may be turned back into the interproximal space without touching the gum tissues. The ends of the wire of the first slip-noose should now be twisted together.

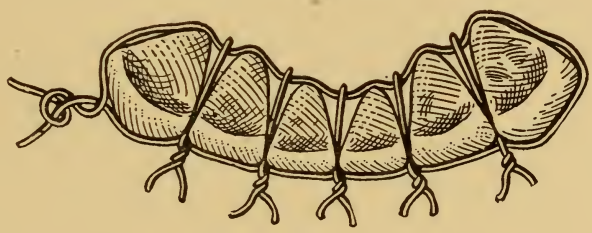


FIG. 121. TEMPORARY WIRE SPLINT (SPIES).

Dr. Robert Good's method of ligating teeth is to use A, B or C sewing silk, having it well waxed. Select tooth for anchorage, then pass ligature twice around this tooth (making double loop) and fasten by making double knot and single knot on top double one. Now make single loop around next tooth and make knots the same as before and continue in this manner, until you have included the number of teeth you wish to ligate or make fast. When the last tooth to be included is reached, make double loop again and return, making the loops the same as before, this will give two rows of ligatures, making the teeth quite rigid. Three

rows or more may be used, making a splint that will remain for six or eight weeks. Care should be taken to place the ligatures on the teeth in a position where they will slip neither up or down, but remain where placed.

In using these temporary splints, it is well to be certain that no undue strain is placed on the teeth, pulling them out of position. Where space exists, many knots may be tied to bridge this, or the wire twisted between the teeth, so as not to draw them into the space.

The writer has seen cases where the wire was placed for temporary splints to be removed at a stated time, but for some cause the patient got away without its being removed, and it remained several years without discomfort. Wire has the advantage of being easily put on and easily replaced; it shows no metal and is easy to keep clean. If it is desired to be permanent, little nicks can be cut with a fissure bur run between the teeth; this will hold the wire secure and prevent it from slipping into the gums. Sometimes a little cement to hold it in place will last for years. The advent of cast work has opened a new field for the ingenuity of the operator in the line of dental splints; small inlays can be made which are easily inserted and this will probably be the means adopted for splints in the future. The old method of swaging these splints and soldering them up did not produce the results which we hoped it would.

In devising the splint, the main requisite is to hold the tooth rigidly in its proper position. It must be self-cleansing or easily cleaned by the patient. Again, it must not extend to the gum margin to fill up the interstitial space, but must be left so that instrumentation of the root surface can be done with ease.

A serviceable splint for the anterior front teeth can be made by shaping the cutting edge of the incisors much like a facing for bridge work. Cut in enough to allow a good thickness of gold, with a small round bur in the right angle

handpiece, drill two holes straight down parallel with the tooth, an inch, straddling the pulp on either side. Each tooth to be splinted is treated the same way. Into these holes iridio platinum pins are fitted, leaving them sticking up slightly above the tooth. Some use pins from vulcanite teeth, but a threaded wire cut into pins the proper length is stronger and more retentive. Over the ground surface of the tooth is burnished a small disc of thin gold plate. The pins for each tooth are stuck through each little finished plate and stuck into sticky wax. The burnished plate with two pins is removed, invested, and soldered. When all the teeth to be splinted have been so treated, the disks containing the soldered pins are placed on all the teeth and the impression taken. As the pins were left protruding, if any of the disks fail to come off in the impression, they can be replaced in position. Modeling compound is to be preferred for this impression. A small model is made of any material on which we can solder.

Some operators prefer to just wax up these pins, place on multiple sprue wires and cast. Considerable experience with this class of splint convinces me that we can not get as good piece of work as in the way I have described.

After the model is separated, one or two platinum wires are bent around similar to the lingual plate bar touching some point on each disk on model. The wire should be very small. Sometimes two wires can be used. This is tacked with solder to all of the discs. These wires add much strength, but the greatest advantage is that we can now at this stage readjust the alignment of all pins and reburnish the discs so that when the work is finished we know it will go evenly to place. The work is now waxed up in the mouth with a small amount of wax and cast, or just as good, solder flowed over the whole and finished. I have not found any other device that will do it as well as this splint, made the way described. Where one of the

four anterior lower teeth is missing, abutments made as above, and placed on each side, will support a missing tooth.

However, after all is said and done, it seems to me it is not of the most benefit to retain the teeth which have to be placed in splints, and it does seem to be the best policy in the beginning to extract those teeth which the operator will soon learn by experience will never be kept in a healthy condition, and which may require extraction later on.

CHAPTER XXXIV.

VACCINES AND EMETINE IN THE TREATMENT OF PYORRHEA

AUTOGENOUS VACCINES IN THE TREATMENT OF PYORRHEA.

The author has been so successful in treating pyorrhea according to methods described elsewhere, that the subject of vaccines has not had much attention in his practice. In discussing this subject at the last National Dental Association in Washington, Dr. Rhein made the statement that when vaccination became necessary, the ordinary dentist was not a necessity because the patient was a fit subject for the hospital.

In order that the reader of this book may become familiar with the elementary facts on which this treatment is based, I give the following article by Dr. George B. Harris, which was published in the *Dental Summary*:

"The use of vaccines in the treatment of pyorrhea is not to take the place of the local treatment of instrumentation in any way. However, it becomes a very valuable agent when used to overcome the infection present and in maintaining a condition that makes the growth of bacteria impossible over a period of sufficient length to permit regeneration. It not only does this, but it also prevents the recurrences of pyorrhea after a cure has been effected by fortifying the individual against the bacteria. Protection against recurrence is as important as a cure itself. Stock vaccines may be used to do this, but it has been my experience that the Autogenous Vaccines give from 50 to 75 per cent. better results.

"The first step in making a vaccine of this kind is the obtaining of the pus. This should be obtained in as pure a culture as possible. Carefully remove all tartar deposits from the teeth; paint the tooth and gum with iodin and dry. On the following day remove all food particles, dry with alcohol again, paint the gum with iodin, and dry. Then carefully force out a small amount of pus from under the gum,

collect on a sterile platinum wire and inoculate an agar tube. Allow this to germinate from twenty-four to forty-eight hours. If a pure culture has been obtained, which is generally the case if the preceding operations have been carefully done the vaccine may be made directly from the first culture and several days saved; otherwise new cultures must be made from the predominating culture in the initial tube.

"Remove as many of the cultures as possible, care being taken not to take up any agar with the cultures. These are now transferred to a tube containing distilled sterile water. This is shaken vigorously to break up all clusters. A centrifugal machine should be used for this purpose, but if one is not to be had it can satisfactorily be done by hand. One-half a cubic centimeter is now drawn up and transferred to another test tube. This is used in the determination of the number of bacteria we may have in the concentrated solution and is not made into vaccine. To this is added two cu. cm. of water to make the counting easier and more accurate. About half a cu. cm. of this diluted solution is now drawn up in an opsonizing pipette and an equal amount of normal blood taken directly after. This is blown out on a slide and mixed. A drop is then placed on a cover glass, dried, mounted and stained. Place the slide on the counting chamber and count the corpuscles and germs in the successive fields until at least 250 corpuscles are counted. Since there are 5,000,000 corpuscles in a cu. mm. of blood, by a simple proportional equation we can determine the number of bacteria in the dilute solution. By multiplying the number of germs in the dilute solution by the number of times it was diluted, we determine the number of germs in the concentrated solution per cu. mm. Since there are 1,000 cu. mm. in a cu. cm., by multiplying the number per cu. mm. by 1,000 we determine the number per cu. cc. For example: Suppose we counted 250 corpuscles and 50 bacteria. Since we know that there are 5,000,000 corpuscles on one cubic millimeter of blood, the following proportion is established: 250:5,000,000::50:X.

"Solving this proportion, we find there are 1,000,000 bacteria per cu. mm. Since there are 1,000 cu. mm. in a cu. cc. we find 1,000,000,000 bacteria to each cu. cc. in the dilute solution. Since we diluted the solution four times, there are 4,000,000,000 bacteria to each cu. cc. in the concentrated solution. The vaccine is now ready to be standardized. It is first diluted to the strength we wish to have it; heated at 60 degrees for an hour, then 4 per cent. tricresol added to prevent contamination, and sealed.

"Any loose tissue may be selected as the site of injection. The most important things to look out for are:

"1. Be sure the solution is sterile.

"2. Absolute cleanliness of the skin at the site of injection.

"3. Use great care in avoiding veins.

"4. Be sure the count is accurate."

Dr. Merritt was one of the first to use the vaccine treatment and read several papers advocating this treatment. Of late he has been convinced that he was wrong and now strongly condemns the treatment. Dr. Merritt says:

"The first requisite to success in the vaccine treatment of any disease is to establish the casual relationship of the organisms to the disease under consideration. Since each organism provokes in the body its own specific ferment, which has no influence whatever upon the organisms of unlike nature, the importance of clearly establishing this relationship will be obvious. So sensitive is this balance between organism and ferment that the slightest variation in type may render the vaccine worthless. In nothing is absolute accuracy of more importance than in vaccine therapy. When it is realized that at present there is not the slightest proof that any of the organisms associated with pyorrhea sustain any casual relationship to it, the irrationality of selecting one or two types out of the vast host of organisms present, and making these the basis for vaccine treatment, must be self evident. In the light of our present knowledge, vaccines of this character have no place whatever in the treatment of this disease."

The dental profession has not realized a great amount of success by the use of vaccines in pyorrhea treatment, for the reason that it does not reduce the responsibility of removing every bit of material containing the infection so that a vaccine could be effective. When this is done, there is little need for the vaccine, for the blood is generally able to take care of any infection which is placed in contact. When the blood is so low in character that it can not do this, the patient is rather beyond dental treatment and needs the services of the physician and hospital.

The use of vaccines may be of service to fortify the patient against reoccurrence after the treatment, but is doubtful whether the length of time this protection would last

is worth the trouble of making and administering the vaccine. A better protection would be the proper training of the patient to keep the local conditions in a healthy state.

TREATMENT BY EMETINE.

The amebae found in the mouth seemed to be similar to the organism causing tropical dysentary. As emetine, the principal ipecac alkaloid, is required as a specific for this malady, the investigators at once suggested its use in the mouth and system to cure pyorrhea.

Dr. Barrett used the ordinary hypodermic syringe with suitable point, injecting emetine hydrochloride half per cent. into each pyorrhea pocket. The needle was placed as far as the bottom of the pocket, then gradually flooding the pocket as the needle was withdrawn. The injection should be repeated daily for a week, then, every day for a period of ten days.

Dr. Bass, in addition to pocket application, injected the drug subcutaneously, with the idea that local application could not reach all the diseased area. The injection consists of one-half grain emetine hydrochloride hypodermically into any convenient part of the body daily for three or four days. Then wait about one week and repeat the injections. He further advises the administration by mouth the tablets of Alcresta Ipecac. This preparation passes through the stomach unchanged and liberates the ipecac in the intestines to be absorbed into the circulation. These tablets are given two or three at a time an hour before meals reducing the dosage if a diarrhea is produced. These tablets seem to be as efficient as hypodermic injection, and eliminate the disagreeable injection.

Heinz' "Fifty Seven Varieties" is not in comparison with the large number combinations of ipecac and emetine which the drug houses were quick to offer the dentist and patient. Their attractive literature leads one to believe that if only

that particular brand of emetine pill, emetine mouth wash, or emetine dentrifice be used, positive relief can be afforded the patient.

On May 6th, 1915, Dr. A. H. Merritt read a paper recording his experiments in looking for the endameba in pyorrhea cases and the treatment by emetine before the Massachusetts State Dental Society at Boston. From this interesting article a quotation at length is given:

In view of the widespread interest aroused by the announcement that the endamoeba buccalis is the direct cause of pyorrhea (18) (19) and that as a result of its destruction by emetine there is marked improvement in the disease (in not a few instances practically curing it) makes it necessary to inquire into the claims made by the advocates of this treatment. In the Proceedings of the New York Pathological Society, 1907, Dr. L. T. LeWald presented a preliminary report of investigations which he had been carrying on as to the occurrence of amoeba in the mouths of healthy individuals. In this report he says he was able to convince himself that these amoeba could be demonstrated in the mouth almost constantly, no matter how much care was taken of the teeth. In the first examination of one hundred cases, he obtained positive results in seventy-one. In going over some of the negative cases, he found amoeba in four more, and he felt that with repeated examinations they could be demonstrated in most if not all the others, and concludes his report with these words: "there was left in my mind no doubt as to their presence in the human mouth in health, equalling in this respect, the presence for instance of the bacillus coli commis in the intestines."

In a paper entitled "Amoeba in the Mouths of School Children," read before the New York Pathological Society in March, 1915, Dr. Williams, Assistant Director of the Research Laboratories of the New York Health Department, reported the result of an examination made by that laboratory.

A preliminary examination was made of 475 school children, between the ages of 9 and 16. 150 were chosen as representative cases, and subdivided as follows:

1. Healthy gums, no caries..... 20
2. Healthy gums, carious teeth..... 22
3. Tartar and receding gums..... 47
4. Spongy and bleeding gums..... 65

From most cases, two smears were made, the teeth and gums having been previously cleansed with a cotton swab dipped in 50% alcohol. These smears were then examined for amoeba, with following results:

Class 1. Healthy gums, no caries, positive..... 30%
Class 2. Healthy gums, carious teeth, positive.... 50%
Class 3. Tartar and receding gums, positive..... 84%
Class 4. Spongy and bleeding gums, positive..... 94%

It will be observed that amoebas were found in every case, and that in inverse ratio to the health and cleanliness of the mouth.

Commenting on this, the author says: "We can say nothing definite yet as to the significance of the amoebas in these mouths. Finding these so often in apparently healthy mouths, and in such young children, does not agree with the statement of Bass and Johns and Barrett, that they are not found in healthy mouths."

From among my own patients, I have to date (March 27th) selected 57 cases for examination, as follows:

Pyorrhea (representing many types, and all stages, from the earliest manifestations to hopeless cases), 47. Unclean mouths, but free from pyorrhea, 4. From around ill-fitting crowns, 4. Clean mouths (meaning those of which one sees only a few in a year, in perfect health), 2.

From one to five smears were taken in each case. These were fixed with methyl alcohol, and sent to the Research Laboratory for examination, with the following results:

Pyorrhea, 47 cases. Positive, 46; negative, 1*.

Unclean mouths, 4 cases. Positive, 3; negative, 1.

Clean mouths, 2 cases, both positive.

From around crowns, 4 cases, all positive.

From among the pyorrhea cases there were selected only 5 for emetine treatment. These showed an abundant discharge of pus, representing different types of disease. In one case, 28 teeth were involved; in another only 4, but all were cases in which the prognosis was favorable. In a word, there were no hopeless cases among them. None had less than six half grain doses of emetine, subcutaneously injected (½ grain daily), and two had more. At the conclusion of these injections, smears were again taken, never less than 3, and from all parts of the mouth. Numbers 1, 19 and 46 were still positive, numbers 5 and 60 were negative. Case No. 1, 28 teeth involved, was then treated with a ½ per cent solution of emetine flowed into the pockets daily for seven days, one Sunday intervening. Several smears were then taken; all were positive. In none was there any improvement which could be observed after the most painstaking examination, except that in case 19, there was less inflammation of the gum around one especially bad tooth, possibly due to the hemostatic action of the drug. This case had had six half grain doses of emetine, and several times the pockets were flooded as directed, yet two of the three smears were still positive.

*A re-examination showed this to be positive.

In none had the pus decreased. Four of the patients reported that their gums felt better, and No. 1 complained of an unpleasant feeling, "as though the gums were rubbed with alum," as she expressed it. How much of this was psychological I do not know. One patient was nauseated and vomited after the first injection of ½ grain. It is realized that these cases are too few to have of themselves any evidential value. They form a part of an investigation begun long before the invitation to prepare this paper was received, and are reported here merely as corroborated of the findings of LeWald and Williams.

It is too early to form any final conclusions regarding the role the endamoeba may play in the etiology of pyorrhea, or of the therapeutic value of emetine in its treatment. However, in view of the evidence already at hand, it may not be out of place to inquire into the present status of this so-called "wonderful discovery."

In the light of this evidence there can be little doubt that the endamoeba is present in practically all mouths, contradicting the statement that they are found only in mouths in which there is pyorrhea (19). It is also probable that emetine is an amoebacide, but an uncertain one at the dosage advocated. Another characteristic of emetine and one of which no mention is made by those advocating its use in pyorrhea, is its hemostatic action (21). An interesting question which naturally suggests itself in this connection, is whether the improvement in the gums ascribed to its amoebicidal quality, may not be due to the fact that it is a hemostatic. The fact that cases with inflamed gums show improvement in this respect, and the statement of patients that their gums feel better, points to this as the explanation, as does the fact that those who were conscious of this improvement while under treatment, after it was discontinued, state that the feeling of improvement gradually disappeared, and that they lapsed back to the condition which prevailed prior to treatment. If this be true (and there is at present no proof that it is not), its effect can only be transitory. On the other hand, if this improvement be due to the amoebacidal action of the drug, it must also be more or less evanescent, since it is practically impossible to permanently eliminate the amoeba from the mouth. Whatever its action may be, there is at present no trustworthy evidence that it will cure pyorrhea. Until this can be done in a sufficient number of cases, and by a number of investigators working independently, there can be no justification whatever for the claim that the endamoeba is the specific cause of pyorrhea.

CHAPTER XXXV.

BUSINESS SIDE OF PYORRHEA ALVEOLARIS.

Dental offices have been flooded with all kinds of literature calling attention to certain medicines and preparations which would "positively cure pyorrhea." Many of these preparations were accompanied by extracts from papers by some of the most prominent men in our profession, who claimed that pyorrhea was of constitutional origin, and that such and such a remedy was the only thing to use. Others gave their endorsement to the various local remedies which needed but to be applied several times for a complete cure. These preparations, having come so highly recommended by the profession, were tried out by the dentists, but the cases of pyorrhea on which they were used were not cured. The failure of all these remedies has made the general practitioner very skeptical as to the possibilities of curing pyorrhea, and it is undoubtedly one reason why so few practitioners have undertaken to treat this disease. The business of treating pyorrhea was largely the sale of proprietary drug preparations.

Another reason for lack of interest in pyorrhea treatment was the fact that the dentist did not try or was not able to secure from the patient the proper remuneration for the work. I have been unable to understand just why this is so, unless it is the failure on the part of the patient to realize the gravity of a beginning pyorrhea. The patient thinks that only his teeth need cleaning and that it is worth probably $1.00 to do this.

Within the last few years, a number of good men have specialized on either prophylaxis or pyorrhea work and

the good work that has been done has forced on the profession the recognition of the fact that pyorrhea work requires the greatest degree of skill and is probably the greatest service that we can render our patients. This work should command the largest fees that a dentist is able to command. It is a fact that patients of means and refinement are most appreciative and willing to pay large fees to the men who can save their teeth from pyorrhea.

DAILY RECORD CARD OF DR. J. B. WEST
DATE ....

Hour.	Name and Address	Hour ent. Chair	Time l. Chair	Total Time	Operation or Prof. Services	Fee	Debit	Credit	Cash

FIG. 122. A simple and effective card to be used by those who wish to employ the "charge for the time" system.

One way is to charge for time, as in other dental work; this plan has serious drawbacks, and it seems to me that it is not the proper idea for surgical work. From the letter of a prominent California dentist, who does considerable work along this line, I give the following:

"I think that 'so much per hour' proposition in a professional charge, is not near so satisfactory as a lump sum; it has taken several years for me to fully appreciate that fact. I have frequently stood for the hour plan when patients requested a lump sum, and I have gotten the worst of it,

in as much as I could have obtained a larger fee had I mentioned a stated sum, the same as a surgeon would do. In suggesting a fee now, I run through the mouth carefully; size up the worst or bad teeth; calculating in my mind the number at $15.00 per hour, and then the others in same proportion; and in that way get at a proposition of lump sum, always adding $25.00, $50.00 or $100.00, as the case may be, in case I anticipate the necessity of a compromise."

My objection to the hour plan in pyorrhea work is that it seems to place our services on the wrong basis—emphasizing the matter of time rather than the results obtained. Also, in case we are interrupted by being called to the phone or to give a few minutes time to someone else, our patient is probably wondering whether or not they are being charged for this time.

A method used by a prominent dentist in New Orleans is to make a charge of $10.00 for each tooth, irrespective of time required for a complete cure.

The system under which the author works is to give the patient an estimate of the entire cost of the operation and treatment before beginning the work. This plan having proved satisfactory and as I have been unable to secure minute data from others, I will give it in detail.

The examination having been concluded, I anticipate the question, "Now, Doctor, how much is this going to cost me?" I at once fill out an estimate sheet; this sheet gives a diagram of the work to be done and the cost of same. There is also a blank space for terms, which is always filled in. At the bottom of this estimate is printed in red, an important notice. (Fig. 123.)

If I know the patient to be able to pay a good fee, to whom service is the main consideration, all that is necessary is to write out an estimate sheet and place it in an envelope with the engagement card; this envelope is handed to the patient on his departure.

A cheap and efficient means of getting up this estimate is to use the one dollar dental outfit published by the John C. Moore corporation, of Rochester, N. Y., and have a local printer insert at the bottom of page the above notice. A heavy carbon sheet is used between two sheets. The copy is torn out and given to the patient; the original is kept in a loose leaf binder.

PRESERVE THIS ESTIMATE

The above is only an approximate estimate of services the exact value of which can only be determined after the operations are completed.

The charges therefore will not be based upon this estimate, but entirely upon what is done. Any change in work named above or additional operations will be charged at our regular fee.

We do not guarantee any operations.

FIG. 123. The estimate book is printed in dublicate with carbon attached. At the bottom of each sheet is printed the above matter in red ink.

It has been found by all men who do operative work in either dentistry or general surgery that a deposit in advance is a most satisfactory basis upon which to work. I have adopted it as an absolute rule which is explained to the patients, and, since I allow no exceptions to this rule, no one raises any objection. If questioned at all, I tell them that it is for their own protection as well as mine; that I know they are as good as gold, but that I want their teeth saved, and if I start into it that I am going to do the very best I can towards this end and that I know if they have from $50.00 to $100.00 paid in advance they are going to keep coming until the work is done. If they did not do this, the first day after their mouths get comfortable, there would

be danger of their not coming back for regular treatment. If they have made the deposit, as I have said, they will keep all appointments as long as you wish.

Sometimes a patient, whom you know to be all right, wishes services, but at the time finds it inconvenient to make a cash payment or to pay within a reasonable length of time. Credits along this line used to be unsatisfactory; at the time of treatment, the results seemed all that I could wish, but such patients would neglect their mouths until oral sepsis had again set in, and would declare that they had received no benefit and refuse to pay. This difficulty has now been solved satisfactorily in my practice by a special promissory note. If they are unable to make a cash payment, then I tell them that if they will give me notes and pay eight per cent. for deferred payments, I am perfectly willing to settle the matter up in this way. (Fig. 124.)

This note is good for any kind of dental operations, especially pyorrhea. If it is not met in due time and the patient for any reason refuses to pay same, instead of being humiliated by having to argue the case in court, this note cuts off debate in justice court and a judgment is immediately given to the dentist. It is a bad proposition to work for people who can not pay, but this note is the best solution of the problem that I have been able to obtain.

If I were going to have any kind of operation performed, I certainly would want to know just exactly what it is going to cost me, and I believe in treating the patients with that fairness which I would ask under the same circumstances.

There was a difficulty which used to present itself to me before I started to keeping copies of the estimates. The patients, after an examination, were told about what the work would cost them. They did not have the work done at that time, but would come in again, probably, at the end of three or four months. After another examination I

$---------- Atlanta, Ga.,----------19----

----------day of ----------next,

----------promise to pay DR. ROBIN ADAIR

----------DOLLARS, with interest from date, at eight per cent. per annum, with all costs of collection, including ten per cent. as attorney's fees, if collected by law or through an Attorney at Law. Each of us, whether principal, security, guarantor, endorser or other party thereto, hereby severally waives and renounces each for himself and family, any and all homestead or exemption rights either of us, or the family of either of us, may have under or by virtue of the Constitution or Laws of Georgia, or any other State, or the United States as against this debt or any renewal thereof; and we especially waive exemptions of all kinds under proceedings in Bankruptcy, and authorize any trustee in Bankruptcy upon proof and allowance of this debt, to retain and sell sufficient of the property claimed as exempt to pay off the amount so allowed on this debt; and each further waives demand, protest and non-payment. Given under the hand and seal of each party.

☞ This note is given for professional services already rendered, and I acknowledge that it is unconditional and binding, and that no defense whatever can be set up against its collection.

Witness our hands and seals.

----------(L. S.)

----------(L. S.)

No.---------- ----------(L. S.)

FIG. 124. A true and tried friend, used by the author, when the patient has not all the ready money to pay his bill, but more appreciated by the dentist if he has to go into court to collect the account.

would again tell them what the charges would be. The patient, having forgotten, would say that I had promised to do it $20.00 or $30.00 cheaper at the time I made the first examination. Now, with my present system, I can refer to my files and can convince him immediately of his mistake. Previously, when other work was done in addition to the work estimated on, the patient, when settling the bill, could not be made to understand that more work had been done, and they would not think it right that any additions should be made to the estimate as first named. My system settles this question and there is never any objection, as the estimate suggests and puts the patients on notice that other work may be discovered and will be charged for.

For instance, in making a bridge abutment, if the tooth that I hoped to use as an abutment could not be saved, then I would have to drop back and make the bridge more extensive; they often thought that the charge should be the same.

The greatest difficulty that I have had is with the question, "Now, doctor, do you guarantee the operation?" I became so tired of hearing this that I inserted at the bottom of the estimate sheet, "We do not guarantee any operations." This immediately settles all questions, and if the patient is not willing to trust himself to my reputation and skill, he is at liberty to go somewhere where a "cure is guaranteed."

This is well answered by Dr. R. G. Hutchinson, Jr., who says:

"A cure does not guarantee immunity and a true recurrence in no way invalidates a cure."

I find that the terms "scaling the teeth," "removing tartar," and "treatment of the gums," do not impress the patients with the seriousness of pyorrhea treatment. There is a fad among people for "operations," and if the dentist calls it by this name, which is really the proper term, our

patients like it much better and are willing to pay satisfactory fees for it. I find it better to do as much of the work on the first day of the engagement as possible—enough to at least verify myself in calling it an "operation." In addition to this business reason, I get better results as described in the chapter on "Treatment."

I do not care to do more than two or three pyorrhea operations in one day, and if I finish one-half the work for each patient, giving each two to three hours, I feel that I have done enough.

In pyorrhea work the use of a proper system in our business dealings with patients should not detract from our professional dignity and the returns will be such that we can have more vacations, more recreation, and more time with our families.

CHAPTER XXXVI.

THE MEDICAL AND SURGICAL ASPECT OF ORAL HYGIENE AND PYORRHEA.

VIEWS OF PROMINENT MEDICAL MEN.—SUGGESTIONS TO PHYSICIANS AS TO CARE OF THE MOUTH IN SICKNESS. —ORAL PREPARATION FOR SURGICAL WORK.

VIEWS OF PROMINENT MEDICAL MEN.

Dr. C. H. Mayo recently read a paper (Jan. 31, 1913) in Chicago, in which he made the following statement: "It is evident that the next great step in medical progress in line of preventive medicine should be made by the dentists."

The facts about oral hygiene, oral sepsis and pyorrhea alveolaris, are of vast importance to the physician, as well as to the dentist. In many cases they are of vital importance and yet comparatively little has been written on the subject.

We have under observation cases treated from ten to fifteen years ago which before treatment, had been advised that extraction was the only thing that would relieve them; but the patients have never lost their teeth. Some of these cases were in such a serious condition that a continued neglect of the mouth condition would probably have resulted in death from septicæmia.

An interesting case in the author's experience was that of a woman who had suffered for several months with very severe pains in the head; her physicians had been unable to afford any relief. The surgeons had advised that an operation be performed on the trifacial nerve. Being called in as a consultant, I found a severe case of pyorrhea

and by treating this for a few days was able to give the patient almost complete relief from pain.

Many cases of interest like the above are contained in my records, but I do not feel that there is room for them in a work of this kind.

Nor will space here allow the insertions of full case records from other specialists, but dental and medical literature is full of them. That the beginner in this work may know what great benefit may be given humanity, mention is made of a few results, selected at random from authoritative reported cases.

Cases of arthritis deformans, due to pyorrhea, have been greatly benefited by dental attention. Ulcer of the stomach, caused by pyorrhea, cured by dental treatment. Many cases of chronic dyspepsia have yielded promptly. Patients who had albumen and casts inside of two weeks have been returned to normal conditions.

Dr. Upson has reported that pyorrhea has caused many cases of insanity and that a large number of such cases are restored by curing the pyorrhea.

Dr. B. Craig, chief of clinic Neurological Institute of New York, in a paper before the American Medical Association, made the following statement:

"For a considerable period it has been observed that a bad condition of the teeth may be responsible for adjacent disorders, such as otalgia and tic douloureux, but the observation that stubborn neuritis of the sciatic or other nerve trunk or of the brachial plexus sometimes disappears after cleaning out the alveolar disease, is of comparatively recent date. The continual swallowing and absorption of pus is undoubtedly the cause of disorders of digestion, headache and finally an anemic condition almost cachectic. This depleted, exhausted state may often be associated with a melancholic state. It seems a far cry from mouth infection to mental disease, but when one witnesses profound depres-

sion clear up following the drainage of several alveolar pus-pockets, one is persuaded that the chronic intoxication, the result of absorption from the pent-up infectious process, was an etiologic factor."

Dyspepsia, flatulence, and gastric ulcer, together with all their varied symptoms, are often caused by the large numbers of bacteria and their products which are constantly swallowed.

The tonsils, bronchi, and even the living membrane of the arteries and heart may become infected from diseased gums. Many cases of eye and ear complications are relieved by curing the case of pyorrhea.

Patients will often want to know how it is that certain of their friends have had pyorrhea for twenty-five years, and seem to get along without any inconvenience. In answer we may assure them that the immunity is more in appearance than real, and that at any time this immunity may suddenly give way, and any of the mentioned complications arise too late for a cure.

Dr. Julian Zilz, of Vienna, reports some interesting statistics about the frequency of the association of diabetes with pyorrhea alveolaris. Seventy-one of the cases examined had pyorrhea alveolaris. Nearly half of these have a history of gum trouble before the diabetes. Only in a small number did the pyorrhea follow the incipiency of the diabetes. In all these cases, the saliva showed acid reaction. This report shows the necessity of making the sugar test with a specimen of the patient's urine.

Dr. M. M. Bettman suggests to the author to "emphasize the constitutional effects of a neglected pyorrheal condition a little more, especially in the light of the findings of Dr. Rosenow, of Rush Medical College. I have noticed numerous times clinically what he has proven experimentally. Only the other day a patient returned for prophylactic treatment whom I had treated about six months before for an aggravated pyorrheal condition and I was very much

surprised at his improved general appearance. At his first visit he informed me that he had lost weight from 215 to 140 pounds. I cured his pyorrhea at that time and without treatment of any kind except for the pyorrhea; he has gradually gained until he now weighs 205 pounds. This is, I think, a very good example of the general effects of the absorption of pus from a pyorrheal mouth."

Dr. H. A. Goldberg reports an interesting series of cases from the Hospital for Deformities and Joint Diseases, of New York. These cases presented symptoms of rheumatism, arthritis, pain in joints, or high temperature. All of them had pyorrhea mouths, and when these were cleaned up, the above-mentioned general symptoms disappeared. His conclusion is to "call the attention of physicians and dentists to the frequency of constitutional infection from septic pyorrhea alveolaris, resulting in joint involvement, which, no doubt, is often wrongly diagnosed as rheumatism and treated as such, without result, while if the cause is recognized and the source of infection in the teeth treated, a speedy and successful result is obtained."

From these examples we would not have our medical friends think that we are claiming the whole of pathology is caused by pyorrhea, or that its treatment is a "cure all," but we will admit that it seems each month to be tending that way, due to the recent startling discoveries, all of which goes to show the intimate relationship which could exist between the two professions.

It should be the aim of all well-informed dentists to instruct all their patients who are nurses and physicians, as to the importance of this neglected field of their work. Such instruction, if put into practice, would undoubtedly help any physician not only to give comfort to the sick, but a quicker restoration to health.

Every dentist is familiar with the great amount of decay and oral sepsis frequently seen in convalescent patients who,

previous to their illness, possessed a normal mouth. On inquiry, we sometimes learn that during sickness these mouths received the usual care as given in hospitals.

In other cases when a person becomes sick he often neglects the little attention formerly given the mouth. Vigorous chewing is dispensed with, exercise of the muscles of mastication ceases, aeration of the mouth is lessened, with the result that all self-cleansing processes are diminished and the saliva becomes thick and ropy. The mouths of the sick are often a hot bed of filth and disease, as indicated by the foul breath, and are a most prolific breeding place for the bacteria of pneumonia, diphtheria, tuberculosis and other diseases.

SUGGESTIONS TO PHYSICIANS AS TO CARE OF MOUTH IN SICKNESS.

Physicians should be told by the dentists that conditions such as the above can be changed for the better. The time will come when the physician will realize the necessity of giving directions for the care of the mouth as a routine procedure in every case of sickness. At the present time the nurse is supposed to attend to the patient's mouth, but most of them are woefully ignorant on the subject and the patient suffers thereby.

When a physician refers a patient under treatment to a dentist, the latter should not be content to limit his work to fillings, crowns and bridges, but should recognize any diseased condition of the gums and should report the findings. This kind of service will often prove of vast importance in the etiology, diagnosis and treatment of systemic disturbances. The discovery of oral sepsis in a patient's mouth is of far more importance to the patient, the dentist and the physician than the filling of teeth. This view of the matter was expressed by Dr. William Hunter, physician and lecturer on pathology, to the Charing Cross Hospital,

of London, in his famous classic upon the subject of "Oral Sepsis."

"One would think poorly of a surgeon or doctor who declined to take the responsibility of treating a follicular (that is, a 'septic') tonsilitis, but insisted on handing over the case to a throat specialist, or who allowed a patient to suck continuously a number of septic sores on his finger. I think no less poorly of any doctor or surgeon who declines to make himself responsible for the treatment of much of the oral sepsis presented by many of his cases. For this is what patients are constantly doing. Wherein consists the pathological difference between a follicular tonsilitis and a foul, septic, suppurating condition of the gums, with deposition of calcareous 'crusts and scabs' (so-called tartar) covering and hiding septic wounds and ulcers, loaded, as miscroscopic examination shows, with staphylococci and streptococci? None whatever, except that the latter is exceedingly common and the tonsilitis is comparatively rare. The pathological condition in both is the same; namely, sepsis. Moreover, it is a sepsis as easily recognized and much of it as easily removed in the case of the one as in that of the other, and the more urgently requiring to be removed, since *it is more important as a potential disease factor than any other source of sepsis in the body* . . .

"The chief feature of this particular oral sepsis is that the whole of it is swallowed or absorbed into the lymphatics and blood. Unlike the sepsis of open wounds on the outside of the body, none of it is got rid of by free discharge on the surface. The effects of it, therefore, fall in the first place upon the whole of the alimentary tract from the tonsils downward. These effects include every degree and variety of tonsilitis and pharyngitis; of gastric trouble, from functional dyspepsia up to gastritis and gastric ulcer, and of every degree and variety of enteritis and colitis and troubles in adjacent parts, *e. g.,* appendicitis. The effects fall in the second place upon the glands (adenitis); on the blood (septic anemia, purpura, fever, septicemia); on the joints (arthritis); on the kidneys (nephritis), and on the nervous system. . . .

"The following cases show to what extent oral sepsis complicates specific fevers, such as scarlet fever, typhoid, diphtheria, and the striking benefits to be got from its removal.

"In 648 cases of scarlet fever admitted to the London Fever Hospital under my care in the four years 1904-7, the incidence of oral sepsis, carefully noted by myself, varied from 25 per cent. to 43 per cent. The effect of oral antisepsis (the removal, as far as possible, immediately on admission, of every trace of oral sepsis around the patient's teeth and gums, by daily swabbing with 1-40 carbolic acid solution) throughout the earlier part of the disease was very striking. The chief complications of the disease were reduced as follows: The incidence of secondary adenitis was reduced from 6 per cent. in 1904

to 3.3 per cent. in 1906 and 1.8 in 1907; of cellulitis of the neck from 5.2 per cent. in 1904 to 2.8 per cent. in 1906 and nil in 1907; of glandular suppuration from 1.7 per cent. in 1904 to 0.5 in 1906 and nil in 1907. The striking improvement was due to the increasing care taken by myself and by my residents and nurses under my instructions. In only one or two cases out of the whole series were any teeth extracted.

"What are the general principles of the treatment applicable to medical sepsis? The first and most important is curiosity about and careful observation of the actual character and degree of the septic foci present in the mouth (naso-pharynx or elsewhere) in every case of medical disease. This observation can not be made by a cursory glance into the mouth and a general conclusion to the effect that the 'teeth are fairly good,' or the mouth 'fairly clean,' or that the mouth 'requires to be seen to.' If you look closely into the mouth of your patients and note what you see, you will observe every degree and variety of septic ulceration; every degree of tartar deposit, as a great effect of these septic inflammation and ulceration; every degree of suppurative inflammation of the gums; every degree and effect of septic periostitis and periodonitis, with formation of pockets and loosening of teeth; every degree and effect of septic osteitis—*e. g.,* rarefying osteitis, causing recession of the bone socket of formative osteitis, causing thickening of alveolus; every degree and variety of septic caries and necrosis of the teeth, and as a result of all these conditions, singly or combined; every degree and variety of septic stomatitis, simple, ulcerative, gangrenous. You will see all this in infinitely less time than it takes to examine a specimen of the gastric contents, or of the feces, or of the urine, or of the sputum; in far less time and with far less labor than it will take you to examine the nose, or the naso-pharynx or the larynx; in far less time than it takes you to examine the heart or the liver, or, indeed, any other organ of the body. In particular cases you will observe that all these septic conditions are produced or intensely aggravated by toothplates covering necrossed roots; by amalgam and gold fillings which have become septic; by porcelain crowns with gold collars; which, however good to begin with, are never really aseptic, and are liable to become extremely septic. All these you can observe in a few minutes, if you look for them—in less time almost than it takes to mention them."

Several other interesting and authoritative quotations are appended:

"There is little doubt in my mind that bad mouth-hygiene favors the development of pneumonia by paving the way for pneumococcus sinusitis, which, as pointed out, frequently antedates a true pneumococcus infection. Any inflammation of the nasal sinuses should there-

fore be promptly treated."—Harvey G. Beck, M. D. (*Interstate Med. Jour.*)

"Bad teeth are an enormous factor in the development of catarrhs. Many a chronic catarrh is kept up for this reason alone."—John B. Huber, M. D. (*New York Med. Jour.*)

"The important part of scarlet fever is a focus of infection located either in the nose, in the mouth, or in the nasal pharynx, and from these sources the poisons are circulated through the body. Thus the poisons are but giving expression to themselves in the eruption that has been held heretofore to be of such consequence.

"The importance of diphtheria I am sure is fully understood, but the enlargements of the glands of the neck, of the nose, of the tonsils, and of the pharynx are due to absorption somewhere in the nose or in the mouth, a very large percentage of which takes place through cavities in the teeth or down the sides of unclean teeth. Not only that, but we are constantly confronted with instances like this, a child has been in a diphtheria hospital and has remained there until it seemed safe for the child to go home. Then the child has gone home, and there has followed an infection with diphtheria in that home. What is the logical explanation? The logical explanation is that in some hidden recess, somewhere in that child, there was a focus of hidden bacteria; and that in all human probability a large percentage, if not an overshadowing percentage, of those infections are either in the tooth cavities or somewhere in close connection with the tooth cavities."—Dr. W. A. Evans, M. D.

In typhoid fever and allied conditions, the mouth is a veritable hotbed of the very infection we most want to control. Just think of your patient having 28 to 30 square inches of infected surface feeding the diseased intestine and no attention being given it. I have proven to my own satisfaction that all cases of fever are more easily cured and have fewer complications when the mouth is maintained in a hygienic condition, before and during illness.

Frankel, Wachselbaum, and Miller agree that the most frequent excitant cause of pneumonia is infection from the mouth. Miller says, "The oral cavity serves as a gathering point for this infection, which from time to time is carried into the lungs with the air, until at last at some weak point, or as the result of some inflammatory action of the lungs, through which the power of resistance is impaired, it obtains a foothold in the lungs. For this reason, there-

fore, and very many others, the neglected oral cavity offers a dangerous cover of infection, which by no means received the attention it deserves."

Numerous investigators have pointed at the tonsil as a possible point of entry of rheumatoid infection. Billings reports cases of multiple arthritis cured by enucleation of the tonsils; also, several cases of arthritis deformans and parenchymatous nephritis due to infection of streptococci planted in pyorrheal pockets.

Dr. A. H. Stevenson, in a letter writes me:

"It is generally believed that the bacteria of the common infections, viz.: diphtheria, pneumonia, scarlet fever, and typhoid invaded the body through the air passages, but Jonathan Wright and other investigators find that the turbinate bones of the nose, and the ciliated epithelium covering the mucous membrane of the nose, act as sieves or screens, preventing most bacteria from entering the throat, bronchi, or lungs by this route. The mouth, therefore, must be the chief means of these infections reaching the lungs or stomach. The function of the stomach may be impaired by this bacterial invasion. The hydrochloric acid, Nature's great germicide, is able to overcome the bacterial attack that occurs with the normal acquiring of food, but the constant ingestion of pyogenic material from a septic mouth seriously interferes with, and may prevent the normal secretion of the hydrochloric acid. This may result in the subsequent disturbance of the process of digestion.

"With a wound on the surface of the body, the bacteria and their toxins are eliminated with the surface discharge, but where there is a lesion of the mouth, an alveola abscess, for example, the septic material is swallowed or disposed of by the lymphatics or the blood. If the resistance of the tissues is high, and the individual in excellent health, this daily toxic dose may be taken care of, but the effect falls upon the entire alimentary tract. Dr. E. C. Kirk calls

this the 'toxic habit,' and like all offensive habits, it becomes apparent to others before it does to the afflicted. Other results showing the results of oral sepsis could be continued 'ad infinitum.' The increase of papers on this subject appearing in the medical journals is encouraging."

In my experience in hospital work I have found that the majority of patients do not receive treatment for mouth conditions. The time-honored method of using a strip of gauze on the finger is better than nothing, but on account of the shape of the teeth a considerable amount of infectious debris is packed between the teeth and into the depressions around the tongue.

If the mouth is first examined in office practice and found to need attention, the physician should send the patient to that dentist whom he has reason to know will put it in a hygienic condition, and instruct the patient in oral hygiene.

If the patient is confined to bed, we know from experience that those who ordinarily brush the teeth often neglect this duty.

Whose duty is it to brush the teeth of the sick patient? The physician should be able to demonstrate to some member of the family, or if a nurse be in attendance, instruct her how to use the brush and mouth wash. I have seldom seen a nurse who knew how to brush her own teeth; therefore I give her implicit instructions as to the proper manner of brushing not only the teeth, but the whole mouth, including the tongue. I hope the day is not far distant when every training school for nurses will incorporate a few lectures on this subject in their course.

The teeth of a bed-ridden patient, even if in normal condition, should be washed properly several times each day and rinsed every few hours with some cleansing solution. The most serious consequence of tooth decay, following sickness, is due to the infection between the teeth. The use of gauze will not remove the material. The tooth brush is

a necessity. It goes between teeth, it removes the accumulation as gauze can not. The texture of the brush should be of the softest grade obtainable. Some good tooth paste should be used in preference to a powder; a powder must be changed into a paste in the mouth before it becomes efficient; before it changes to a paste, some of it gets lodged between the teeth, where it stays; some of it is apt to be inhaled, irritating the throat and lungs. A paste does the work quicker and has the advantage that it generally contains some antiseptic. This must be followed by a mouth wash, and for this purpose lime water or salt water will answer, but a prescription of chlorate of potash, with a few drops of phenol is efficient for the purpose of cleansing and disinfecting.

Even though a patient can not raise his head, oral cleanliness must not be neglected. Here it is good practice to irrigate the teeth and mouth by turning the head to one side, having the patient draw the fluid into the mouth through a long glass tube, and instructing him to close the lips and force the fluid between the interspaces of the teeth, flushing the whole cavity and the throat. In other cases, the ordinary long-spout feeding-cup can be used without the patient moving the head. By closing the lips over the spout, this cleansing liquid can be drawn into the mouth and later emptied back into the cup just as it was received. In other cases, it is advisable to use the fountain syringe and flush out the mouth just as you would any other infectious cavity. Use a nozzle that will give a fine stream and don't be afraid to use plenty of pressure.

If oral sepsis is present, in addition to the cleansing it is necessary to make a topical application of some formulae as Skinner's Disclosing Solution, Buckley's Pyorrhea Astringent, or AA Pyorrhea Treatment (pages 176, 391, 404), or some similar preparation containing iodine, which drug alone will penetrate in the mouth.

Proper attention to the mouths of the sick and before operations by the surgeon will undoubtedly be productive of comfort to the patient preventing infections and will prove one of the greatest aids that can be used to restore the health of the patient.

ORAL PREPARATION FOR SURGICAL WORK.

If there is one place where the dentist can be of great help to the general surgeon, it is in the preparation of the mouth before the anesthetic is given for all operations. The surgeon wears a mask, and is all attention to every detail, but often neglects a great source of infection and danger—the mouth. Dentists should urge the strengthening of this chain in aseptic surgery. No doubt many of the post-operative pneumonias are due to infection from septic mouths containing pneumococci. In this regard we must teach our physician friends not to rely on rinsing the patient's mouth with the ordinary solutions used as mouth washes. Undoubtedly, it would be safer for the patients if their mouths could be cleaned by a staff hospital dentist, and the day is not far distant when just as much attention will be given the mouth in hospital wards as is now accorded examinations of the heart, lungs or kidneys.

The above should serve to give a glimpse into the many important and practical relations between medicine and dentistry. The solution of such problems requires knowledge on the part of the dentist and full recognition of the importance of mouth hygiene on the part of the medical profession.

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